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COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
1401 EAST BROAD STREET
RICHMOND, VIRGINIA 23219 2000

Charles A. Kilpatrick, P.E.
Commissioner

June 13, 2014



#6141

Ms. Leslie Romanchik
Virginia Department of Environmental Quality
629 East Main Street
Richmond, VA 23219

Subject: Request for Permit Modification
VDOT Culpeper District Headquarters
EPA I.D. No. VAD980715064

Dear Ms. Romanchik:

The Virginia Department of Transportation (VDOT) is requesting a Class 2 Permit Modification of its Hazardous Waste Management Post-closure Care Permit for the subject facility in order to incorporate "Site-wide Corrective Action" as deemed necessary subsequent to completion of the RCRA Facility Investigation and the Corrective Measures Study. In addition, modifications to requirements for financial assurance, cost estimation, training and security are also being requested.

The facility's Post-closure Care Permit was issued on September 14, 2005, and required the VDOT perform various investigations at identified Solid Waste Management Units (SWMUs) and Areas of Concern to determine if corrective measures would be necessary at these areas. VDOT conducted a Phase I RCRA Facility Investigation (RFI) and submitted the report of findings to the Virginia Department of Environmental Quality (VADEQ) dated May 14, 2009. VDOT performed subsequent additional evaluations and investigations associated with several areas, and submitted results to VADEQ in various documentation. On March 25, 2013, VADEQ issued correspondence to VDOT requesting that a Corrective Measures Study (CMS) report be prepared to evaluate and propose remedies for areas requiring remedial measures. For the subject facility, these areas included SWMU No. 8 and SWMU No. 9. VDOT submitted a CMS report to VADEQ on May 31, 2013, and was revised on August 1, 2013. VADEQ approved the CMS report as per correspondence dated December 18, 2013. Subsequently, VADEQ prepared a Statement of Basis summarizing the selected remedies for the referenced SWMUs at the VDOT Culpeper District Headquarters Facility.

The requested Class 2 Permit Modification incorporates VADEQs proposed Decision of Corrective Action Remedy Selected into the permit. The proposed remedy includes a soil removal action to remediate impacted soil to unrestricted land-use remediation goals at SWMU No. 9, and construction of an engineered cover and institutional controls, include land-use restrictions for industrial end-use, for SWMU No. 8. Below is an itemized summary of the specific components of the permit that are proposed for modification.

- Table of Contents – Modified
- Module II, General Facility Conditions – Modified
- Module VI, Site-wide Corrective Action – Modified
- Attachment A – Modified
- Attachment B – Modified
- Attachments E, F and G – Modified
- Attachment M – Modified
- Attachments N through R – Removed
- Attachment S – Renumbered to Attachment N
- Attachment T – Renumbered to Attachment O
- Attachment P – Added
- Attachment U – Renumbered to Attachment Q
- Attachment V – Renumbered to Attachment R

Following is a proposed schedule to comply with the public notice/public comment stipulations for the subject Class 2 Permit Modification request.

Issue Class 2 Permit Modification Request to DEQ	6/13/14	
Publish Public Notice in the Culpeper Star Exponent	6/20/14	Day 7
Deliver notification of the modification request to facility mailing list	6/20/14	Day 7
Conduct Public Meeting at VDOT Culpeper District Headquarters, 1601 Orange Road, Culpeper VA 22701	July 28, 2014, 1:00 PM	Day 45
Public Comment Period Ends	August 19, 2014	Day 67

The Class 2 Permit Modification fee of \$2,400.00 will be remitted to Treasurer, Commonwealth of Virginia, Department of Environmental Quality, Receipts Control. If there are any questions, please contact the undersigned at (804) 371-6824.

Sincerely,



Ed Wallingford
Hazardous Materials Program Manager

cc: Mr. Brett Fisher
Ms. Jutta Schneider
Mr. Richard Doucette
Mr. Rick Crofford
Mr. Lou Hatter
Mr. Larry George - Cardno-MM&A

**POST-CLOSURE PERMIT
VIRGINIA DEPARTMENT OF TRANSPORTATION
CULPEPER HEADQUARTERS
VAD980715064**

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dated 7/23/2009, 8/28/2009, and 1/26/2010 – (Incorporated by Reference.)

MODULE II
GENERAL FACILITY CONDITIONS

II.A. DESIGN AND OPERATION OF FACILITY

The Permittee shall maintain and operate the Culpeper District Headquarters whose location is shown by the facility map and topographic map and recorded on the survey plat (**Permit Attachments A, B, and C**) to minimize the possibility of a fire, explosion, or any unplanned sudden or nonsudden release of hazardous waste constituents to air, soil, groundwater or surface water which could threaten human health or the environment.

II.B. GENERAL WASTE ANALYSIS

Wastes managed in the Sign Shop Vat consisted of spent solvents that were discharged from a soaking trough. Reportedly, 60 gallons of fresh solvent were added to the trough annually. Waste generated at the Sign Shop was referred to as a "xylene waste mixture". Approximately 420, 55-gallon drums of waste paint containing out-of-date paint, dried paint solids, "skims" of semi-solid paint were excavated and removed

A list of all hazardous wastes which were ever known to have been placed in the waste management units is provided in the List of Wastes, **Permit Attachment D**. This list is based upon information provided by the facility.

II.C. SECURITY

The Permittee shall comply with the security provisions of 40 CFR 264.14. The security provisions shall follow the requirements described in **Permit Attachments E and F**.

II.D. GENERAL INSPECTION REQUIREMENTS

The Permittee shall follow the inspection plan set out in **Permit Attachment G**. The Permittee shall remedy any deterioration or malfunction discovered by an inspection (40 CFR 264.15). Inspection records shall be kept as required by 40 CFR 264.15(d).

II.E. PERSONNEL TRAINING

The Permittee shall conduct required personnel training (40 CFR 264.16). This training program shall follow **Permit Attachment H** and the Permittee shall

maintain training documents and records (40 CFR 264.16(e))

II.F. RECORDKEEPING AND REPORTING

II.F.1. Operating Record.

The Permittee shall maintain a written operating record at the facility in accordance with 40 CFR 264.73. The record can be a compilation of various documents and shall include, but not be limited to, the information listed below.

- a. The following records shall be maintained until post-closure is complete and certified:
 1. Records of spills and releases required by existing environmental laws, including, but not limited to § 103 of the Comprehensive Environmental Response, Compensation and Liability Act,
 2. Written reports and records of verbal notification to the Director to address releases, fires, and explosions;
 3. All reports of noncompliance pursuant to **Permit Section I.H.11**;
 4. All submittals prepared pursuant to **Permit Section I.H.12**;
 5. Records of all monitoring information pursuant to **Permit Section I.E**; and
 6. Training records of current Facility personnel.
- b. The following records shall be maintained for a minimum of 3 years. This time period may be extended by the Department in the event of enforcement action or notification by the Department that an investigation is ongoing.
 1. Generator Biennial Reports submitted in compliance with 40 CFR Section 262.41;
 2. Facility Annual Reports submitted in compliance with 40 CFR 264.75;
 3. Training records of former Facility personnel; and
 4. Records of all inspections, pursuant to 40 CFR 264.15, which shall include at a minimum:
 - i. The date and time of the inspection;

- ii. The name of the person performing the inspection;
 - iii. A notation of the observations made; and
 - iv. The date and nature of any repairs or remedial actions.
- c. Current copies of the following documents as amended, revised, and modified shall be maintained at the Facility until post-closure and corrective action are complete and certified:
- ~~1. Training Plan; and~~
 - ~~2. All closure, post-closure, interim measures, and final corrective action cost estimates; financial assurance documents prepared pursuant to this Permit, and the company names and addresses of Facility insurers.~~

II.F.2. Required Reports.

The Permittee shall comply with all applicable reporting requirements as described in **Permit Sections I.E and I.H.**

MODULE VI
SITE-WIDE CORRECTIVE ACTION

**VI.A. CORRECTIVE ACTION FOR CONTINUING RELEASES;
PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT**

- VI.A.1. Section 3004(u) of RCRA, 42 U.S.C. § 6924(u), and regulations codified at 40 CFR §264.101, provide that all permits issued after November 8, 1984 must require corrective action as necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any solid waste management unit (SWMU), regardless of when waste was placed in the unit.
- VI.A.2. Under Section 3004(v) of RCRA, 42 U.S.C. § 6924(v), and 40 CFR §264.101(c), the Department may require that corrective action at a permitted facility be taken beyond the facility boundary where necessary to protect human health and the environment, unless the owner or operator of the facility concerned demonstrates to the satisfaction of the Department that, despite the owner or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake such action.
- VI.A.3. Section 3005(c)(3) of RCRA, 42 U.S.C. § 6925(c)(3), and 40 CFR § 270.32(b) provide that each permit shall contain such terms and conditions as the Department determines necessary to protect human health and the environment.
- VI.A.4. ~~This Permit requires the Permittee to conduct a RCRA Facility Investigation (RFI) for potential releases of hazardous waste or hazardous constituents at specified SWMUs and Areas of Concern (AOCs) identified at the Facility. The RFI will be performed under two phases, a Phase I RFI and a Phase II RFI. The purposes of the Phase I RFI are to provide a preliminary assessment and investigation of the nature and extent of potential releases from SWMUs and AOCs, to screen SWMUs and AOCs from further investigation, to focus the RFI, and to determine whether interim/stabilization measures are necessary. The purpose of the Phase II RFI is to thoroughly evaluate the nature and extent of releases of hazardous waste and hazardous constituents, and their degradation by-products from regulated units, SWMUs, and any other AOCs at the Facility based upon the findings in the Phase I RFI. The RFI includes the collection of site-specific data and an evaluation of potential impacts to human health and the environment from potential contamination from the Facility. The RFI will gather all data necessary for the Department to determine whether a Corrective Measures Study (CMS) is required. If, on the basis of the RFI findings and any other relevant information, the Department determines that a CMS is necessary, the Permittee will be required to conduct a CMS for those releases from SWMUs or AOCs which threaten human health or the environment.~~

~~VI.A.5. The Permittee may have completed some of the tasks required by this Permit and may have some of the information and data required by this Permit. Previous work may be used to meet the requirements of this Permit. Unless previously approved by the Department, such previous work must be submitted to and approved by the Department in accordance with Permit Section I.L.~~

~~VI.A.6. The Permittee shall prepare Facility specific scopes of work and reports relating to Interim Measures, RCRA Facility Investigation, Corrective Measures Study and any Risk Screening or Risk Assessment in accordance with the applicable parts, as defined by Permit Section VI.O., of the relevant attachments. The Permittee shall establish specific and appropriate elements of such scopes and reports to the Department's satisfaction under conditions I.L. of this Permit.~~

VI.B. INTERIM MEASURES

~~VI.B.1. The Permittee may, at any stage of the RFI, if applicable, submit to the Department, in writing, a proposal to perform corrective action interim measures for the remediation of any release of hazardous waste or hazardous constituent at or from a SWMU/AOC. Any such proposal shall include a schedule for performance of such interim measures. For any releases to soil, groundwater, sediment and surface water, the Permittee must demonstrate in such proposal, to the Department's satisfaction, that the subsurface conditions and contaminant plume relating to such release have been adequately characterized and that the proposed interim measures will adequately remove, contain, or treat the released hazardous waste or hazardous constituents as necessary to protect human health and the environment. The nature and extent of releases to other media shall likewise be adequately characterized and evaluated by the Permittee in such a proposal. The Department shall review the voluntary Interim Measure proposal and determine whether such a proposal will be considered for approval and whether such interim measures are of such scope that they require implementation of the public notice requirements specified under VI.F.1., Corrective Measures Remedy Selection. The Department shall notify the Permittee of the approval or disapproval of the interim measures proposal. If the Department approves such a proposal, the Permittee shall be allowed to dispense with certain stages of the investigation, as described in the Department's approval of the interim measures proposal. No term or condition of this Permit, except as otherwise provided for by this Permit, shall be affected by the approval of such proposal until such time as this Permit has been modified to include such proposal if such modification has been requested by the Permittee or by the Director under Permit Section VI.B.2. As appropriate, the Department or the Permittee may seek modification of this~~

~~_____ permit pursuant to 9 VAC 20-60-270.41 or § 270.42 and § 124.5 to include such proposal.~~

~~VI.B.2. _____ If the Department determines, on the basis of information submitted by the Permittee pursuant to Permit Section VI.C., VI.H., or VI.J. or any other information, that corrective action is necessary to protect human health or the environment from a release of hazardous waste or constituents from a SWMU/AOC, the Permittee may be required to implement Interim Measures.~~

- ~~a. _____ Within sixty (60) calendar days of receipt of the Department's notice to implement corrective action Interim Measures at specified SWMUs/AOCs, the Permittee shall submit to the Department and to EPA Region 3 an Interim Measures Plan (Plan). The Plan must be approved by the Department in accordance with Permit Section I.L. This Plan shall conform to the requirement of condition 1, Attachment Q - Interim Measure Requirements. Should the Permittee believe that any requirements of Attachment Q are inappropriate for this SWMU/AOC, the Permittee shall identify the particular requirement and explain why the requirement is inappropriate.~~
- ~~b. _____ According to the approved schedule, the Permittee shall submit to the Department the plans required by the Interim Measure Design Program, condition 2, Attachment Q. These plans must be approved by the Department in accordance with Permit Section I.L. of this Permit.~~
- ~~c. _____ According to the approved schedule, the Permittee shall submit to the Department for approval the reports required by condition 3, Attachment Q.~~
- ~~d. _____ Nothing in this Permit shall preclude the Permittee from performing voluntary Interim Measures at any time either to reduce or eliminate the risk to human health or the environment, or to prevent or reduce the spread of contamination (Permit Section VI.B.1). Such measures, (e.g., source removal, capping, groundwater pump and treat) may be taken at any time during the term of this Permit.~~
- ~~e. _____ Nothing in this Permit shall limit the Department's authority to undertake or require any person to undertake response action or corrective action under any law, including but not limited to, Sections 10.1-1402.19 and 1455 of the Virginia Waste Management Act (1950), as amended. Nothing in this Permit shall relieve the Permittee of any obligation it may have under any Federal or State law, including, but not limited to, Section 103 of CERCLA, to report releases of hazardous waste, hazardous constituents or hazardous substances to, at, or from the Facility.~~

~~VI.C. RCRA FACILITY INVESTIGATION PHASE I~~

~~VI.C.1. Phase I RCRA Facility Investigation Submission~~

~~A Phase I RCRA Facility Investigation Plan (Phase I RFI) is required to be submitted to the Department and EPA Region 3 within ninety (90) calendar days of the effective date of this Permit. The Phase I RFI Plan must be approved by the Department in accordance with Permit Section I.L. The Phase I RFI Plan shall include each of the SWMUs and AOCs identified in Attachment M and shall meet the following minimum objectives and requirements.~~

~~The Phase I RFI objectives are to~~

~~a. Identify releases or suspected releases of hazardous waste and/or hazardous constituents into air, soil, sediments, surface water, and/or groundwater, which need further investigation to determine whether corrective measures are necessary to protect human health and the environment, and/or the implementation of Interim Measures at the Facility.~~

~~b. Screen from further investigation those SWMUs/AOCs which do not pose a threat to human health or the environment.~~

~~VI.C.2. Phase I RFI Plan Requirements~~

~~a. Phase I RFI Sampling Plan~~

~~1. The Phase I RFI Sampling Plan shall provide for the analyses for hazardous waste and hazardous constituents identified in Attachment N. Also, any hazardous constituents not identified in Attachment N that is known or suspected to have been treated, stored, disposed, or contained in the SWMU shall also be included for analysis.~~

~~2. If information exists which fulfills the objectives of the Phase I RFI for any of the SWMUs or AOCs, the Permittee may include complete documentation in the Phase I RFI Plan.~~

~~3. The Phase I RFI Plan shall fulfill the Phase I RFI Plan requirements specified in Attachment O and comply with the quality assurance and quality control requirements of Attachment R.~~

~~4. The Phase I RFI Sampling Plan shall provide for the analyses of samples from any existing groundwater wells, both potable and non-potable, which exist at the Facility. The analyses shall include, at a minimum, an evaluation of volatile, semivolatile and inorganic hazardous constituent concentrations, plus pH. The analyses of~~

- ~~groundwater shall include all constituents specified in 40 CFR Part 264, Appendix IX, Groundwater Monitoring List or a reduced list of constituents for analysis may be proposed with appropriate justification. (See Attachment N for analytical requirements)~~

~~VI.C.3. Phase I RFI Report Requirements~~

~~a. Phase I RFI Report Submittal:~~

- ~~1. The Permittee shall fulfill the requirements of the approved Phase I RFI Plan in accordance with the terms and schedules set forth in the plan, including the submission of an approved Phase I RFI Report for the Department's approval.~~
- ~~2. The Phase I RFI Report shall fulfill the requirements specified in Attachment O, RCRA Facility Investigation Requirements.~~
- ~~3. The Phase I RFI Report shall include a discussion of the need for and the feasibility of implementing interim measures immediately, see conditions VI.B., Interim Measures, and VI.H., Emergency Response; Release Reporting.~~

- ~~b. In lieu of Permit Section VI.C.1, the Permittee may elect to proceed with the Phase II RCRA Facility Investigation for any one of all of the identified SWMUs/AOCs. The Permittee shall notify the Department of such election no later than the time required for submission of the Phase I RFI Plan. In such case, the Permittee shall submit a Phase II RFI Plan for each such SWMU/AOC to the Department and to EPA Region 3, for approval, within ninety days of the effective date of this Permit. Such Phase II RFI Plan shall meet the requirements of Permit Section VI.D.1 and 2, and Attachment O.~~

~~VI.D. RCRA FACILITY INVESTIGATION PHASE II~~

~~VI.D.1. Phase II RCRA Facility Investigation Plan Submission~~

~~In accordance with Permit Section VI.J.3., within ninety (90) days after the receipt of the Department's approval of a Phase I RCRA Facility Investigation (RFI) Report, the Permittee shall submit to the Department and to EPA Region 3 a Phase II RFI Plan.~~

~~The Phase II RFI Plan must be approved by the Department in accordance with Permit Section I.L. This Phase II RFI Plan shall meet the objectives and requirements specified below:~~

The Phase II RFI objectives are to:

- a. Characterize the presence, magnitude, extent, direction, concentration, and rate of migration of releases of hazardous waste or hazardous constituents from each SWMU/AOC into groundwater, surface water, air and/or soil.
- b. Identify actual or potential human and/or ecological receptors.
- c. Provide a detailed geologic and hydrogeologic characterization of the area surrounding and underlying each SWMU/AOC.
- d. Determine the need for and scope of corrective measures.
- e. Identify and characterize releases of hazardous waste or hazardous constituents, and hazardous constituent degradation by products from SWMUs/AOCs listed in Attachment M, which have not been screened from further investigation under the Phase I RFI, as approved by the Department.

VI D.2. Phase II RCRA Facility Investigation Plan Requirements

- a. The Phase II RFI Plan shall include a listing and general descriptions of the SWMUs/AOCs requiring further investigation, the identification of SWMUs and AOCs screened from further investigation in the Phase I RFI, the Project Management Plan, the Community Relations Plan, the proposed schedule, and shall conform to the applicable requirements of Attachment O, RCRA Facility Investigation Requirements.

Should the Permittee believe that any of the requirements of Attachment O are not appropriate, the Permittee may submit a complete justification of the inappropriateness for the Department's approval within sixty (60) days of the effective date of this Permit. Such a submittal shall not stay the requirements of this Permit until and unless the Department has approved the submittal.

b. Phase II RFI Sampling and Analysis Plan

- 1. The Permittee shall submit a Phase II RFI Sampling and Analysis Plan (Plan). The Plan shall provide for analysis of hazardous waste and/or hazardous constituents released from each SWMU/AOC. The analyses of groundwater shall include all constituents specified in 40 CFR Part 264, Appendix IX, Groundwater Monitoring List or a reduced list of constituents for analysis may be proposed with appropriate justification. Also, any hazardous constituent not listed in Attachment N, that is known or suspected by the Permittee to have been treated, stored,

- ~~— disposed or contained in the unit, shall also be included for analysis.~~
- ~~— The Permittee may combine individual SWMUs/AOCs into study areas.~~
- 2. The Phase II RFI Sampling and Analysis Plan shall provide the rationale for the selection of sample locations and number of samples. The Permittee shall identify the specific sampling locations for each SWMU/AOC and for each affected environmental media.
- 3. The Phase II RFI Sampling and Analysis Plan shall include Sample Collection Methods and Procedures Plan and a Quality Assurance Project Plan (**Attachment R**), which conform to the analytical requirements set forth in **Attachment N**. The Permittee shall also furnish to the Department and to EPA Region 3 the Laboratory Data Package as specified in **Attachment R**.
- 4. The Department reserves the right to require the Permittee to furnish the Department with split samples for any samples taken by the Permittee pursuant to this Permit. Where split samples are taken and analyzed, the Department will provide the results to the Permittee for evaluation in the Phase II RCRA Facility Investigation Report. The Permittee shall identify a procedure in the Sampling Plan for notifying the Department of any planned sampling dates.
- 5. The Phase II RFI Sampling Plan must identify the management and disposition of any wastes generated as a result of the investigation. If any of the SWMUs/AOCs contain hazardous wastes, whether the hazardous wastes are regulated or not by federal or state regulations, the Permittee shall comply with applicable regulations including the Land Disposal Restrictions as contained in 40 C.F.R. Part 268.

VI.D.3 Phase II RCRA Facility Investigation

- a. The Permittee shall conduct the investigations specified in **Attachment O**, which are necessary to characterize the Facility (Environmental Setting), define the source of any release of hazardous waste or hazardous constituents (Source Characterization), define the degree and extent of contamination (Contamination Characterization), and identify actual or potential receptors.
- b. The investigations must result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative(s) during the Corrective Measures Study. The Permittee shall implement the plan requirements described in **Permit Section VI.D.2**.

~~VI.D.4. Phase II RCRA Facility Reporting Requirements~~

- ~~a. The Permittee shall fulfill the requirements of the approved Phase II RFI Plan in accordance with the terms and schedule set forth in such approved plan, including the submission of a Phase II RFI Report for the Department's approval. The Permittee shall submit copies of the Phase II RFI Report to the Department. The Permittee shall also submit bi-monthly (i.e., every two months) progress reports to the Department beginning two months after the Department's approval of the plan and continuing until the RFI Report is submitted. The bi-monthly reporting shall include, at a minimum: activities completed within the reporting period; any deviations from the Phase II RFI Plan, and the identification and schedule of remaining activities. The Department shall include any other specifications in its approval of the Phase II RFI Plan.~~
- ~~b. The Permittee shall submit in writing justification requesting an alternate progress reporting schedule for the Department's approval. This alternate progress reporting schedule may be approved by the Department without requiring a permit modification to Permit Section VI.D.4.~~

~~VI.D.5. Phase II RCRA Facility Investigation Report~~

- ~~a. The Permittee shall submit a Phase II RCRA Facility Investigation (RFI) Report to the Department and EPA Region 3. The Phase II RFI Report shall include an analysis, summary and results of all investigations performed pursuant to the Phase II RFI Plan. The Phase II RFI Report shall also summarize the salient findings under the Phase I Report. The objectives of the Phase II RFI Report are: 1) to document that the investigation and data are sufficient in quality (e.g., quality assurance and quality control (QA/QC) procedures have been followed) and scope (quantity) to adequately characterize the nature and extent of contamination; 2) characterize the potential threat to human health and the environment, and 3) to support the Corrective Measures Study. The Phase II RFI Report shall conform to the applicable RFI requirements of Attachment O.~~
- ~~b. The Phase II RFI Report shall include a discussion of the need for and feasibility of implementing interim measures immediately, see Permit Sections VI.B, and VI.H.~~

VI.E. CORRECTIVE MEASURES STUDY

~~VI.E.1. If the Department determines, on the basis of the RFI or any other information, that corrective measures for releases of hazardous waste or hazardous constituents are necessary to protect human health or the environment, the Department will advise the Permittee of this determination, and the reasons therefore, in writing. The Permittee shall submit to the Department for approval a Corrective Measures Study (CMS) Plan within ninety (90) days of receipt of notification of such determination. Copies of the CMS Plan shall also be submitted to the Department and EPA Region 3. The CMS Plan shall include a schedule for expeditious performance of the study. The plan shall fulfill the requirements of Attachment P, and must be approved by the Department, in accordance with permit conditions I.L of this Permit.~~

~~VI.E.2. Within ninety (90) days of receipt of the Department's written approval of the CMS Plan, the Permittee shall begin implementation of the approved CMS Plan. In accordance with the terms and schedules in the approved CMS Plan, the Permittee shall submit for the Department's approval, a CMS Report which recommends a Corrective Measure(s) in accordance with the requirements set forth in Attachment P of this Permit. Copies of the CMS Report shall also be submitted to the Department and EPA Region 3.~~

VI.FB. CORRECTIVE MEASURES IMPLEMENTATION

V.FB.1 Corrective Measures Remedy Selection Background

The VDOT Culpeper District Headquarters has been in operation since the late 1930's, and has historically been used for storage/maintenance of VDOT vehicles, storage of materials, road sign production and various administrative/dispatch services. Three hazardous waste management units (HWMUs) were previously operated on the facility, and were closed in the late 1990's. Residual impact to groundwater from principally volatile organic compounds (VOCs) was identified at two of the three HWMUs (Paint Pit and Sign Shop Vat). A HWMU Post-closure Care Permit was issued for the facility on September 14, 2005. On September 21, 2010, a Class III Permit Modification was adopted to accept and outline requirements for implementation of a Corrective Action Program to address the select VOCs identified in groundwater beneath the two HWMUs. The remedy, as described in Module VII, is monitored natural attenuation (MNA) was immediately implemented, and the required semi-annual monitoring and reporting has been conducted since that time.

In the facility's Post Closure Care Permit Application (March 15, 2001 with revisions on January 25, April 19 and August 8, 2002), Ten (10) Solid Waste Management Units (SWMUs) were have been identified at the facility, and were labeled as SWMUs 1-10. A listing and description of the SWMUs are provided in Attachment M. Prior to the issuance of the HWMU Post-Closure Care Permit, environmental investigations/remediation activities were performed at several of the SWMUs including SWMUs 1-7, and 9. As per the requirements set forth in the

permit, a Phase I RCRA Facility Investigation (Phase I RFI) was conducted pursuant to the Phase I RCRA Facility Investigation (RFI) Work Plan (July 7, 2006, revised June 28, 2007) to assess conditions at SWMU 8 and 10, as well as to assess current groundwater conditions at SWMUs 1-7. VDOT elected to prepare an Interim Measures (IM) Work Plan (December 9, 2009) for SWMU 9, and no further assessment was performed during the Phase I RFI. Subsequent to completing the scope of work outlined in the Phase I RFI Work Plan, various follow-up investigations were performed at SWMU's 7, 8 and 10. Results of all RFI-related investigations were summarized in various reports submitted to VADEQ. VDOT also prepared an Evaluation of Potential Future Land Use (December 6, 2011), and an industrial land-use scenario was approved for the facility. Based in the results of the RFI-related investigations and consideration of industrial land use, corrective action was deemed necessary to address impacted soil identified at SWMU 8. The principal COCs associated with SMU8 included select VOCs, metals, PAHs, pesticides and PCBs. A Corrective Measures Study (CMS) was conducted and a remedy proposed in the CMS documentation submitted to VADEQ (May 31, 2013; Revised August 1, 2013). The CMS also incorporated the remedial measures that had been outlined in the IM Work Plan for SWMU 9. Additional assessment and corrective action background information is provided in Attachment A.

- a. ~~Based on reports and information submitted by the Permittee during the RCRA Facility Investigation (RFI), the Corrective Measures Study (CMS), and other relevant information, the Department may require the Permittee to evaluate further, and report upon, one or more additional remedies or develop particular elements of one or more proposed remedies. Such further requirements will, if necessary, be incorporated into this Permit pursuant to 40 C.F.R. §§ 270.41 or 270.42. The Permittee must follow all steps detailed in Attachment S and Attachment T of this permit, if additional evaluations and reports are needed to select a remedy.~~
- b. ~~A public notice and public meeting shall be held for the purpose of receiving comments regarding the Corrective Measures Remedy Selection. The public notice and meeting shall be to present the findings and recommendations in the CMS Report. The public meeting shall include the presentation of the alternative corrective measures considered and the corrective measures which are recommended in the CMS Report. The Permittee shall send a notice of the public meeting to all persons on the facility mailing list and shall publish this notice in major local newspaper of general circulation. The notice shall include the following:~~
 - 1. ~~Announcement of a 60-day comment period, beginning on the date the Permittee publishes the notice in the local newspaper, and the name and address of the Department where comments shall be sent.~~
 - 2. ~~Announcement of the date, time, and place for a public meeting. The public meeting shall be held not earlier than 30 days after the~~

~~publication of the notice and no later than 15 days before the close of the 60 day comment period. The meeting shall be held to the extent practicable in the vicinity of the permitted facility.~~

- ~~3. Name and telephone number of the Permittee's contact person.~~
- ~~4. Name and telephone number of a contact person at the Department.~~
- ~~5. Location where copies of the CMS Report and any supporting documents can be viewed and copied.~~
- ~~6. The following statement: "The Permittee's compliance history during the life of the permit is available from the Department of Environmental Quality."~~

- ~~c. All public comments shall be considered prior to selection and approval of the final Corrective Measures Remedy by the Department.~~

VI.FB 2 Final Remedy Selection

- a. Based on the findings set forth in the RFI and CMS documents, VDEQ has determined that past operations at the Facility have resulted in impacts to soil at SWMUs 8 and 9. VDOT has elected to remediate COCs at SWMU 9 to unrestricted land use criteria pursuant to the December 9, 2009 IMWP. Constituents of Concern (COCs) at SWMU 9 include lead and select Polycyclic Aromatic Hydrocarbons (PAHs); COCs in soil at levels exceeding industrial land use at SWMU 8 include select metals, VOCs, PAHs, pesticides, and PCBs are provided in Attachment P.

The final remedy for the Facility emphasizes source control through the following activities: excavation of impacted soils in SWMU 9; construction and long term maintenance of an ~~engineering cap~~engineered cover in SWMU 8 to prevent exposure to impacted soil and to inhibit infiltration of precipitation through the impacted soil, continued groundwater monitoring at the two HWMUs in accordance with Module VII of this Permit; and the implementation of institutional controls (ICs). COCs at SWMU 9 include lead and select PAHs. An industrial land use assumption will be adopted for SWMU 8. COCs in soil at levels exceeding industrial land use at SWMU 9 include select metals, VOCs, PAHs, pesticides, and PCBs. The final remedy for the Site was developed based on the CMS results and the Administrative Record, and is described in the Statement of Basis, issued by the Department dated June 13, 2014. The requirements of this Permit provide for the implementation and maintenance of the remedy described in the Statement of Basis.

- b. The Corrective Action objective for the impacted soil at the Facility is to prevent human and environmental exposure to the COCs, and to control potential COC migration. The remediation goals for soil at SWMU 9 are based on unrestricted land use scenario and

protection of groundwater. The remediation goals for soil at SWMU 8 are predicated based on an industrial land use scenario and protection of groundwater. The soil remediation goals for the Facility SWMU 8 and 9 are provided in Attachment P. The final remedy for the Facility consists of removal of soil and off site disposal at SWMU 9. The final remedy associated with SWMU 8 includes construction and maintenance of an engineered cap and institutional controls to maintain industrial land use and integrity of the engineered cap.

- c. The final remedy for SWMU 8 and 9 is summarized below and will be described in more detail in the site-specific Corrective Measures Implementation Work Plan required by this Permit. Minor modifications to the activities, studies, techniques, procedures, designs and schedules utilized, as applicable, in carrying out the requirements of this Permit and necessary for the completion and maintenance of the remedy may be made by agreement between DEQ and VDOT.

SWMU 9

- Excavate, characterize, transport/dispose soil at a permitted facility, and backfill/restore area of soil removal at SWMU 9

SWMU 8

- Construct engineered cap to cover area of impacted soil to prevent exposure to impacted soil and using materials to inhibit infiltration of precipitation through the impacted soil
- Long term maintenance of the engineered cap to maintain integrity and performance standards
- Implementation and maintenance of institutional controls including property use restrictions to maintain industrial land use and prevent damage to the integrity of the engineered cap

VI.FB.32.

Corrective Measures Final Remedy Implementation

- a. Within ninety (90) days of receipt of the Department's written approval of the Corrective Measures Remedy, Permit modification incorporating the Final Remedy the Permittee shall submit a Corrective Measure Implementation (CMI) Work Plan for the capping/covering of SWMU 8 and excavation of SWMU 9, inspection and maintenance of the cap/cover, groundwater monitoring of the two HWMUs, as well as the implementation of ICs, and additional property use restrictions ICs and additional restrictions to be used at the site shall. Department's approval in accordance with the requirements set forth in Attachment T Q of this Permit. Upon approval of the CMI Work Plan, the Permittee shall submit the Corrective Measure Design Reports to the Department in accordance with the requirements set forth in Attachment T Q of this Permit
- i. notify prospective buyers of the property of the environmental conditions at the Facility and of VDEQ's selected corrective measures as part of the remedy for the Facility under RCRA Corrective Action;

- ii. prohibit the use of groundwater beneath the property ~~except for non-contact cooling water and~~ potable and sanitary purposes to support selected corrective measures,
 - iii. require inspection and maintenance of the ~~cap~~cover over SWMU 8;
 - iv. all earth moving activities, including excavation, drilling and construction activities in SWMU 8 shall be conducted in such a manner that such activities will not pose a threat to human health and the environment or adversely affect or interfere with the Final Remedy, and provided VDEQ's prior written approval; and
 - v. If it is determined that vapor intrusion poses a threat to human health, a vapor intrusion control system, the design of which shall be approved in advance by VDEQ, shall be installed in each new structure constructed above the contaminated groundwater plume or within 100-foot around the outermost wells exhibiting concentrations above the GPS, ~~unless it is demonstrated to VDEQ that vapor intrusion does not pose a threat to human health and DEQ provides prior written approval that no vapor intrusion control system is needed.~~
- b. The Permittee shall, at a minimum, provide coordinate surveys for applicable property use restrictions that meet the following requirements.
- Define the boundary of each use restriction as a polygon
 - Establish the longitude and latitude of each polygon vertex as follows
 - Decimal degrees format
 - At least seven decimal places
 - Negative sign for west longitude
 - WGS 1984 datum
- c. A notification to prohibit well drilling under Virginia's Private Well Regulations, 12VAC 5-630-380 will be provided to the local health district (Town of Culpeper) in writing describing the nature and extent, including a map, of the contaminated groundwater located on the Facility property. An updated notice will be prepared and submitted if significant changes occur to the ~~The notice will be updated every three (3) years to reflect the latest~~ contaminated groundwater plume boundary. A copy of the notification will be provided to VDEQ.
- ~~bd. The Corrective Measure Implementation Final Design Report shall be submitted to the Department as a Major Class 2 Permit Modification request in accordance with the requirements of 9 VAC 20-60-270.42.e. 40 CFR § 270.42. Upon completion of the public notice and public meeting requirements and upon the Department's approval of the CMI Final Design Report, the Permittee shall develop and implement construction in accordance with procedures, specifications, and schedules in the approved Final CMI Design Report and CMI Work Plan in accordance with the requirements set forth in~~

~~Attachment T of this Permit. Copies of all CMI Plans and CMI Design Reports and other CMI Reports shall be sent to the EPA Region 3 Department.~~

~~eed.~~ Upon completion of construction and upon an initial period of performance of monitoring the corrective measure(s), the Permittee shall prepare and submit copies of the final CMI Report to the Department ~~and the EPA Region 3~~ which delineates the implemented corrective measures, design, operation and maintenance, and performance of the constructed system(s) and complies with the requirements delineated in ~~Attachment TO~~. Final ~~"as-built"~~ plans and specifications of the corrective measures systems for SWMU 8 shall be certified by a Professional Engineer registered with the Commonwealth of Virginia and shall be submitted to the Department ~~and the EPA Region 3~~ with the final CMI Report.

~~fed.~~ CMI Progress Reports shall be provided on an ~~quarterly and annual~~ basis to the Department ~~and the EPA Region 3~~ as delineated in accordance with ~~Attachment TO~~.

VI.CC. EVALUATION OF THE SELECTED REMEDY

Commencing one year from the submittal date of the final CMI Report, the Permittee shall submit an annual progress report by March 1st of each following year on the corrective measure(s) remedy performance as a component of the annual groundwater monitoring report. If the Department determines that the selected remedy will not comply with the media clean-up requirements, the Department may require the Permittee to perform additional studies and/or perform modifications to the existing Corrective Action remedy. If necessary, the Department or the Permittee may seek modification of this Permit pursuant to 40 C.F.R. § 270.41 or § 270.42 and § 124.5 to implement modifications to the existing Corrective Measures Remedy.

VI.HD. EMERGENCY RESPONSE; RELEASE REPORTING

VI.HD.1. Emergencies

If, at any time during the term of this Permit, the Permittee discovers that a release of hazardous waste or hazardous constituents at or from the Facility is presenting or may present an imminent and substantial endangerment to human health or the environment, ~~and such release is not subject to Contingency Plan and Emergency Procedures as defined in the portion of the RCRA Permit issued by the Department,~~ the Permittee shall:

- a. Notify the Department as soon as practicable of the source, nature, extent, location, and amount of such release, and the endangerment posed by such release and the actions taken and/or to be taken, to the extent known, to

address such release. Such notification shall be confirmed in writing within three (3) days of discovery of such release.

- b. Unless otherwise directed by the Department, immediately take such actions as are necessary and appropriate to address such release.

VI.HD.2. Releases

The Permittee shall notify the Department in writing of the nature, source, extent location of a release of hazardous waste or hazardous constituents at or from the Facility within seven (7) days of discovery of such release which:

- a. Is not being addressed by corrective measures at the time of such discovery.
- b. Is not being addressed pursuant to **Permit Section VI.BVI.D**, ~~Interim Measures, or VI.H.1, Emergencies.~~ Emergency Response; Release Reporting.
- c. ~~Is not subject to the Contingency Plan and Emergency Procedures as set forth in the portion of the RCRA Permit issued by the Department.~~

VI.HD.3. If, based on the information submitted in Permit Section VI.HD.2, a release has not been adequately remediated to be protective of human health and the environment, the Department may require the SWMU/AOC to be included in an ongoing RCRA Facility Investigation or may require Interim Measures. (see Permit Section VI.B.)

VI.HD.4. Nothing in this Permit shall limit the Department's authority to undertake or require any person to undertake response action or corrective action under any law, including but not limited to, Sections 104 or 106 of CERCLA, 42 U.S.C. §§ 9604 or 9606, and Section 7003 of RCRA, 42 U.S.C. § 6973. Nothing in this Permit shall relieve the Permittee of any obligation it may have under any law, including, but not limited to, Section 103 of CERCLA, to report releases of hazardous waste, hazardous constituents or hazardous substances to, at or from the Facility.

VI.IE. GUIDANCE DOCUMENTS

Any corrective action performed at the facility shall be in general accordance with applicable EPA RCRA Corrective Action Guidance available at <http://www.epa.gov/reg3wcmd/ca/caresources.htm>

~~In addition to guidance documents specified elsewhere in this Permit or Attachments, the following documents shall be referred to, as appropriate and utilized to meet the requirements of plans, reports, and corrective action measures required by this permit:~~

(Note. This list is not intended to be an all inclusive list of EPA guidance documents, but rather a list of the more commonly used guidance documents. This list does not preclude the use of any EPA guidance document.)

1. ~~U.S. EPA, May 1978 (Rev. May 1986), NEIC Policies and Procedures, Office of Enforcement and Compliance Monitoring, National Enforcement Investigations Center. EPA 330/9-78-001 R, Denver, Colorado, 80225.~~
2. ~~U.S. EPA, March 1987, Data Quality Objectives for Remedial Response Activities, Volume 1 Development Process, Volume 2: Example Scenario, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement. EPA 540/6-87/003a, OSWER Directive No. 9335.0-7B.~~
3. ~~U.S. EPA, April 1989, Handbook of Suggested Practices for the Design and Installation of Ground Water Monitoring Wells. EPA/600/4-89/034.~~
4. ~~U.S. EPA, October 1986, RCRA Facility Assessment Guidance, Office of Solid Waste, OSWER Directive No. 9502.00-5.~~
5. ~~U.S. EPA, May 1989, Interim Final RCRA Facility Investigation (RFI) Guidance, Volumes I-IV, Office of Solid Waste, OSWER Directive No. 9502.006D.~~
6. ~~U.S. EPA, June 1988, Interim Final RCRA Corrective Interim Measures Guidance, Office of Solid Waste, EPA/530-SW-88-029, OSWER Directive No. 9902.4.~~
7. ~~U.S. EPA, August 1991, Handbook - Stabilization Technologies for RCRA Corrective Actions, Center for Environmental Research Information, EPA/625/4-91/029.~~
8. ~~U.S. EPA, November 1992, RCRA Ground Water Monitoring; Draft Technical Guidance, Office of Solid Waste, EPA/530-R-93-001.~~
9. ~~U.S. EPA, September 1986, RCRA Ground Water Monitoring Technical Enforcement Guidance Document; NWWA/EPA Series (National Groundwater Association), NTIS No. PB87-107751.~~
10. ~~U.S. EPA, May 1994, RCRA Corrective Action Plan, Office of Solid Waste, EPA 520-R-94-004, OSWER Directive No. 9902.3-2A.~~
11. ~~Cohen, Robert M. and Mercer, James W. DNAPL Site Evaluation, (funded by U.S. EPA), 1993.~~

~~12. U.S. EPA, May 1995, Land Use in the CERCLA Remedy Selection Process, Office of Solid Waste, OSWER Directive No. 9355.7-04.~~

~~13. Any future Agency guidance provided by EPA to the Facility regarding Corrective Measure Studies, Design or Implementation.~~

VI.JEF.
VI.JEF.1

SOLID WASTE MANAGEMENT UNIT (SWMU) ASSESSMENT

The Permittee shall notify the Department and the EPA Region 3, in writing, of any newly identified SWMU at the Facility, no later than thirty (30) days after the date of discovery. The notification shall include, but not be limited to, the following known information:

- a. A description of the SWMU type, function, dates of operation, location (including a map), design criteria, dimensions, materials of construction, capacity, ancillary systems (e.g., piping), release controls, alterations made to the unit, engineering drawings, and all closure and post-closure information available, particularly whether wastes were left in place.
- b. A description of the composition and quantities of solid wastes processed by the units with emphasis on hazardous wastes and hazardous constituents.
- c. A description of any release (or suspected release) of hazardous waste or hazardous constituents originating from the unit. Include information on the date of release, type of hazardous waste or hazardous constituents, quantity released, nature of the release, extent of release migration, and cause of release (e.g., overflow, broken pipe, tank leak, etc.). Also, provide any available data that quantifies the nature and extent of environmental contamination, including the results of soil and/or groundwater sampling and analysis efforts. Likewise, submit any existing monitoring information that indicates releases of hazardous waste or hazardous constituents has not occurred or is not occurring. The Permittee may refer to information regarding releases previously submitted to the Department under **Permit Section VI.H and VI.B-D.**
- d. A discussion of the need for and feasibility of implementing interim measures immediately; see **Permit Section VI.B.**

VI.JEF.2.

Upon receipt of the notification of any newly identified SWMU, the Department will determine the need for corrective action at such SWMU. If corrective action is necessary to protect human health or the environment, the Department will

determine whether a RCRA Facility Investigation will be performed and the need for and scope of any Interim Measures for a newly identified SWMU.

- VI.~~JEF~~.3. Within sixty (60) days after receipt of the Director's determination that a RCRA Facility Investigation or Interim Measure is necessary, the Permittee shall submit a RCRA Facility Investigation Plan or Interim Measures Workplan that meets the applicable guidance. The Department's determination shall either specify the media and/or parameters to be investigated or shall require the Permittee to propose and justify the selection of media and/or parameters Within ninety (90) days after the receipt of the Department's approval of a Phase I

~~RCRA Facility Investigation (RFI) Report, the Permittee shall submit to the Department and the EPA Region 3, a Phase II RFI Plan that meets the requirements of Permit Sections VI.D.1. and 2, respectively. The Department's determination shall either specify the media and/or parameters to be investigated or shall require the Permittee to propose and justify the selection of media and/or parameters.~~

- VI.~~JEF~~.4. Within the time specified in the approved RCRA Facility Investigation (RFI) or Interim Measures (IM) Work Plan, the Permittee shall submit the RFI or IM Report. The RFI or IM Report will provide all data necessary for the Department to determine whether a Corrective Measures Study (CMS) or additional IM Work Plan is required Within the time specified in the approved RCRA Facility Investigation Plan, the Permittee shall submit the RCRA Facility Investigation Report fulfilling the requirements of Permit Sections VI.D.3. through VI.D.5.

- VI ~~JEF~~.5. In lieu of a separate RCRA Facility Investigation, the Permittee may propose either to incorporate any newly identified SWMU into an ongoing RCRA Facility Investigation or to submit a proposal for the performance of the ongoing corrective measures at such newly identified SWMU in accordance with the provisions of Permit Section VI.A. Any such proposal shall be submitted to the Department along with notification of the discovery of the SWMUs.

VI.F FINANCIAL ASSURANCE

In accordance with 40 CFR 264.140(c), the Facility is exempt from financial assurance requirements.

VI.F.1 Initial Cost Estimate

~~Assurances of financial responsibility for corrective action must be provided in accordance with conditions herein. Within ninety (90) calendar days of receipt of the Department's written approval of the Corrective Measures Remedy, the Permittee shall submit an initial cost estimate for completing the approved remedy(ies). The initial estimate may be based on the Corrective Measure Study, the approved remedy(ies), or any other available information.~~

VI.F.2 ~~Cost Estimate Updates~~

~~The cost estimate for completing the approved remedy(ies) shall be updated pursuant to the development of more detailed information (e.g., Corrective Measure Design) and any modifications to the approved remedy(ies). Within ninety (90) calendar days of receipt of Department's written approval of modifications to the final remedy, the Permittee shall submit an updated cost estimate to the Department.~~

VI.F.3 ~~Financial Assurance Demonstration~~

~~By March 31st following approval of the initial cost estimate for financial assurance (see Permit Condition VI.F.1), and each succeeding year, the Permittee shall demonstrate compliance with financial assurance to the Department for completing the approved remedies in accordance with 40 C.F.R. §264.101(b). By March 31st following approval of any revised cost estimate (see Permit Condition VI.F.2), the Permittee shall demonstrate to the Department financial assurance for the updated cost estimates.~~

VI.LG. ~~RECORDKEEPING~~

Solid waste management units:

Upon completion of closure of any SWMU, the Permittee shall maintain in the Facility operating record, documentation of the closure measures taken.

VI.MH. ~~ACCESS FOR CORRECTIVE ACTION OVERSIGHT~~

The Department and its authorized representatives shall have access to the Facility at all reasonable times for the purpose of monitoring compliance with the provisions of this Permit. The Permittee shall use its best efforts to obtain access to property beyond the boundaries of the Facility at which corrective action is required by this Permit (see Section 3004(v) of RCRA, 42 U.S.C. § 6924(v) and 40 CFR 264.101(c)); (1) for itself and any contractor of the Permittee for the purpose of taking corrective action required by this Permit, and (2) for Department and its authorized representatives for the purposes described in this paragraph.

VI.NI. COMPLETION OF REMEDY

Within ten (10) days of receipt of notification by the Department that the remedy is complete, the Permittee shall submit a written certification to the Department via registered mail stating that the remedy has been completed in accordance with the requirements of this Permit Modification. The certification must be signed by the Permittee and by an independent registered professional engineer registered in the Commonwealth of Virginia.

In cases where no other permit conditions remain, the Permit may be modified not only to reflect the completion determination, but also to change the expiration date of the Permit to allow earlier permit expiration in accordance with 40 CFR Parts 124, 270.41, and 270.42, as applicable

VI.O. ATTACHMENTS TO PERMIT PART VI

~~All activities, workplans, reports, and/or other deliverables required by Permit Part VI, shall be conducted, and/or prepared in accordance with the applicable parts of the relevant Attachments, M through U. The Permittee may propose to the Director for approval, alternatives to Attachments M through U. These alternatives, based upon site specific conditions and/or EPA guidance, may be approved by the Director following a determination that the alternative is at least as effective as the applicable requirements of the relevant attachment in achieving the goals and requirements of the RCRA Corrective Action Program (40 CFR 264.101). The Director's determination may include the results of public participation in accordance with the Community Relations Plan.~~

ATTACHMENT A

FACILITY LOCATION MAP DESCRIPTION AND
CULPEPER DISTRICT HEADQUARTERS CORRECTIVE ACTION BACKGROUND

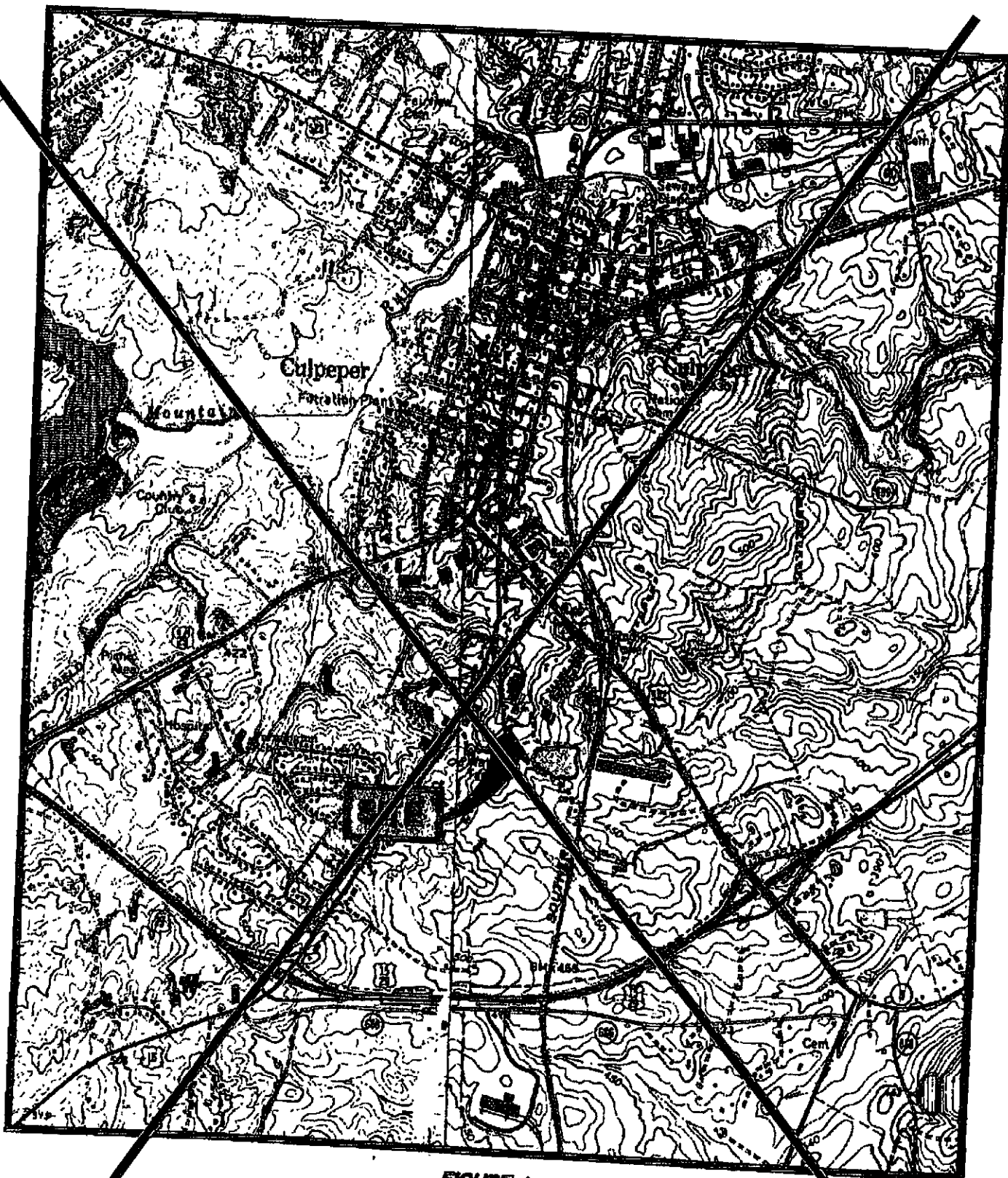


FIGURE 1

VIRGINIA DEPARTMENT OF TRANSPORTATION
 CULPEPER DISTRICT HEADQUARTERS
 1801 ORANGE ROAD
 CULPEPER, CULPEPER COUNTY, VIRGINIA

2,000' 0 2,000'

SCALE 1:24,000

VICINITY MAP

Prepared by



DOTWEST T0008 10/2004

USGS 7.5' CULPEPER EAST & WEST, VA QUADRANGLES
 1973 & 1971 RESPECTIVELY - EAST QUADRANGLE PHOTOGRAPHED 1976,
 PHOTO-COLORED 1986 - WEST QUADRANGLE PHOTOGRAPHED 1976



ATTACHMENT A

FACILITY DESCRIPTION AND CORRECTIVE ACTION BACKGROUND

Facility Description

The Culpeper District Headquarters is located in the Town of Culpeper, Culpeper County, Virginia. A map depicting the location of the facility is provided as Figure 3, Attachment B. The Facility is owned and operated by the Virginia Department of Transportation (VDOT), and is comprised of several office buildings, garages, and various storage areas/buildings situated on a 52.8-acre parcel of land. Figure 4, Attachment B, depicts the general layout of the facility. The Culpeper District headquarters facility has been in operation since the late 1930's. Various activities conducted or historically conducted at the site include storage/maintenance of VDOT vehicles, storage of materials, sign production, and various administrative/dispatch services

The facility address and contact information is provided below:

VDOT Culpeper District Headquarters
1601 Orange Road
Culpeper, VA 22701
(540) 829-7500

The VDOT Central Office is located in Richmond, VA at the following address

Virginia Department of Transportation
1401 East Broad Street
Richmond VA 23219-2000

Corrective Action Background

Regulated Units

Unit Closure

A closure and post-closure plan ("Clean Closure, Contingent Closure, and Contingent Post-closure Plans-Revision 1, Hot Vat Stripper Ditch Area", dated August 8, 1997) was submitted to VADEQ for the HVSD. The referenced plan was implemented during December of 1998. The results of the closure sampling were summarized in the closure certification report dated July 8, 1999 and titled "Closure Report, Paint Pit Area and Hot Vat Stripper Ditch Waste Management Units, Culpeper VDOT, Culpeper, Virginia". Based on the data evaluation and associated risk assessment, it was recommended to clean-close the unit for soils with unrestricted land use. VADEQ approved the risk-based clean-closure of the unit as per correspondence dated August 30, 2000. A copy of the correspondence is provided in Appendix A.

Closure of the SSV was conducted in two phases, one prior to the execution of the RCRA Compliance Agreement and the other subsequent to execution of the RCRA Compliance Agreement. The initial phase of closure was performed in late 1993 and 1994. This phase

included removal of contaminated groundwater that had backed up into the tank, removal of the concrete covering the tank, high-pressure spray washing of the concrete block walls, collection of the wash water, and removal of the block walls and a portion of the drain line. In addition, approximately 2 feet of soil was removed from the sidewalls and bottom of the tank after the block walls had been removed. Approximately 12,000 gallons of contaminated groundwater including all decontamination rinseates, and 45 tons of contaminated debris and soil were disposed in accordance with applicable regulations.

The second phase of closure of the SSV was performed in accordance with the June 4, 1998 plan titled "Clean Closure, Contingent Closure, and Contingent Post-closure Plan – Sign Shop Vat Area: Revision 3, VDOT-Culpeper District Headquarters Facility". This document also provided detail regarding the earlier closure activities associated with the unit. The plan provided for completing closure of the unit by removal of all remaining physical components of the SSV including the concrete flooring of the storage building, all components of the drainfield, associated piping and contaminated soil. Closure activities began on November 3, 1998 and concluded on December 3, 1998. In total, the excavation area encompassed 4,543 square feet with 846 cubic yards of soil and gravel removed. The results of this second phase of closure activities were summarized in a closure certification report dated January, 1999 and titled "Sign Shop Vat, Hazardous Waste Management Unit, Culpeper VDOT, Culpeper, Virginia, Closure Report". VADEQ issued a notice of clean-closure of the SSV soils.

Closure of the PP was also completed in two phases, the first prior to execution of the RCRA Compliance Agreement. The initial phase of closure was completed in the early to mid-1990's, when VDOT initiated the voluntary removal of approximately 420 drums of waste paint and 500 tons of contaminated soil. This material was characterized and sent off-site to appropriate disposal facilities. The estimated dimensions of the excavation after removal were 80 to 90 feet long, 45 feet wide, and 16 to 18 feet deep. Given that some contaminated soil was removed in addition to the drums, the size of the unit was likely somewhat smaller than area of excavation created by the removal action.

The second phase of the PP closure was completed pursuant to the July 16, 1997, document titled "Clean Closure, Contingent Closure, and Contingent Post-closure Plans-Paint Pit Area". Details concerning the earlier drum and soil removal activities were summarized in this document. In December of 1998, the soil sampling specified in the clean closure plan was conducted. The results of the closure sampling and data evaluations were summarized in the closure certification report dated July 8, 1999 and titled "Closure Report, Paint Pit Area and Hot Vat Stripper Ditch Waste Management Units, Culpeper VDOT, Culpeper, Virginia". VADEQ subsequently approved clean-closure of the unit for soils as per correspondence dated September 13, 2000.

Groundwater Detection Monitoring

Groundwater detection monitoring was implemented and completed for the HVSD between April of 1998 and July of 1999 in accordance with the August 14, 1998 plan titled "Groundwater Detection Monitoring Plan – Revision 2, Hot Vat Stripper Disposal Area, VDOT Culpeper District Headquarters Facility". The results of the groundwater monitoring and evaluation of the data were summarized in the June 23, 1999 report titled "Groundwater Detection-Monitoring

Program Summary Report, Hot Vat Stripper Ditch Area, VDOT Culpeper District Headquarters Facility". The results of the groundwater detection-monitoring program revealed that operation of the unit had not adversely affected groundwater. Accordingly, VDEQ did not require further action for groundwater, and the HVSD HWMU was "clean closed".

Groundwater Quality Assessment

During assessment work to characterize the geology and hydrogeology of the site, it was determined that operation of the SSV had impacted groundwater. Similarly, impact to groundwater from operation of the PP was also discovered during the early stages of the groundwater detection-monitoring program for the unit. Accordingly, a groundwater quality assessment plan (GOAP), titled "Groundwater Quality Assessment Plan, Sign Shop Vat and Paint Pit Areas, Revision 1" dated May 20, 1997, was prepared in order to outline the technical approach for assessing the extent of groundwater impact and further characterizing the Site hydrogeology. Subsequent to approval of the GOAP by VADEQ, the first phase of the assessment was completed and the results summarized in a report titled "Phase 1 Groundwater Quality Assessment-Sign Shop Vat and Paint Pit Areas", dated July 30, 1999. Additional groundwater assessment phases were conducted, as summarized in the "Phase 2 Groundwater Quality Assessment Report", dated February 24, 2004, and "Summary Report for Results of Phase 3 Ground Water Quality Assessment" report ("Phase 3 Report") dated October 29, 2004.

Post-closure Care Permit

In the September 13, 2000 VADEQ correspondence referenced in Section 3.1.3, VDOT was required to submit a Post-Closure Care Permit (PCCP) application for the PP and SSV. The permit application was originally submitted on March 15, 2001, with subsequent revisions submitted on January 5, April 19, and August 8, 2002. The PCCP was completed by DEQ on September 14, 2005 and received by VDOT on April 7, 2006. The PCCP outlined VDOT's requirements for post-closure care, groundwater compliance monitoring and corrective action associated with the three HWMUs.

Compliance Monitoring Program

During the course of the Groundwater Quality Assessment, VDOT conducted semi-annual groundwater monitoring and reporting associated with the PP and SSV areas. Subsequent to receiving the PCCP, VDOT conducted semi-annual compliance monitoring and reporting in accordance with Module V of the PCCP. The compliance-monitoring program continued through the half of 2010.

Corrective Action Monitoring Program

On January 28, 2009, VADEQ issued correspondence to VDOT requesting establishment of a Corrective Action Program for the PP and SSV due to ongoing exceedances of the Groundwater Protection Standards at both units. Accordingly, on July 23, 2009, VDOT submitted a document titled "Class III Permit Modification Request" wherein the technical basis and monitoring plan was outlined for implementing Monitored Natural Attenuation as the Corrective Measure for groundwater at these HWMUs. Subsequent revisions to the request were submitted by VDOT on August 28, 2009 and January 26, 2010. VDOT satisfied public notification requirements for the Class III Permit Modification via publishing a notice in the Culpeper Times on February 1,

2010, completing required mailings to those on the facility mailing list, and holding a public informational meeting at the facility on February 23, 2010. VADEQ issued a draft of the permit for the Permit Modification on July 1, 2010, and initiated the public comment period on July 23, 2010. The required 45-day public comment period expired on September 7, 2010. The only comments received by VADEQ were those provided by VDOT, and the comments were addressed in the VADEQ Response to Comments Document (RTCD), dated September 21, 2010. The Class III Permit Modification was formally approved by VADEQ on September 21, 2010 and revised permit sections were issued. A copy of the September 21, 2010 correspondence is provided in Appendix A. Subsequent to this approval by VADEQ, VDOT has performed semi-annual monitoring and reporting in accordance with Module VII "Corrective Action Program, Groundwater Monitoring – Regulated Units"

Solid Waste Management Units

Assessment and Corrective Action Prior to RFI

Releases from SWMUs 1-5 and SWMU 7 were identified during closure activities to remove underground and above-ground storage tanks from the facility. Various soil and groundwater assessments were conducted during and after the closures, and residual impacts to soil and/or groundwater from gasoline and/or diesel fuel remained in the area of these SWMUs. VADEQ evaluated all of the environmental data from each area, and determined that the residual impacts did not required any further assessment or corrective action at the time, and closed each incident

VDOT implemented a voluntary remedial action at SWMU 9 in 2003 to remove surface soil across an area where visible debris associated with batteries was identified. Approximately 3-6 inches of surficial soil was removed in area with dimensions about 45 by 50 feet. The soil was staged in a roll-off container, characterized, and disposed off-site at a permitted facility. Post-removal sampling was conducted at superimposed grid-node locations. The results for lead at one grid-node location and select polynuclear aromatic hydrocarbons (PAHs) at a second grid-node location exceeded risk-based screening levels for unrestricted land use.

Phase I RCRA Facility Investigation

VDOT completed the Phase I RCRA Facility Investigation (RFI) in accordance with the Phase I RFI Work Plan dated July 7, 2006, revised June 28, 2007. The elements of the Phase I RFI focused on assessing current groundwater quality conditions associated with the previously closed petroleum fuel USTs (SWMUs 1-5) and ASTs (SWMU 7), and assessing soil to identify if a release had occurred associated with operation of the Former Salvage Metal and Debris Storage Site (SWMU 8) and the Suspect Waste Disposal Area (SWMU 10). VDOT elected to address the minor soil impacts at SWMU 9 (Former Equipment and Battery Storage Area) via Interim Measures. The results of the Phase I RFI were summarized in detail in the Phase I RCRA Facility Investigation Report dated May 14, 2009. Following is a brief overview of the scope and results of the Phase I RFI

Two temporary groundwater monitoring wells were installed hydrogeologically down-gradient of SWMUs 1-5 for the purpose of assessing if impacted groundwater, if present, had migrated towards the facility boundary. The wells were developed and sampled for subsequent analysis of

TPH GRO and DRO, BTEX and methyl-tert butyl ether (MTBE) Neither sample contained concentrations of TPH GRO, benzene, ethylbenzene and xylenes at concentration above the laboratory reporting limits. Both samples contained low concentrations of TPH DRO and one of the two samples contained toluene at an estimated concentration between the laboratory method detection limit and quantitation limit. The estimated concentration of toluene was, however, below the EPA MCL and, moreover, toluene was also identified in the trip blank at a similar estimated concentration. No EPA MCLs are established for TPH DRO and GRO.

Four temporary groundwater monitoring wells were installed, developed and sampled in the area of SWMU No. 7 where the AST system components were located. Samples from the temporary monitoring wells were analyzed for TPH GRO and DRO, BTEX and MTBE. All samples contained low concentrations of TPH DRO. One of the samples (TW-3) contained TPH GRO and BTEX constituents. The concentration of benzene in the sample from TW-3 was slightly above the EPA MCL.

At SWMU No. 8, a surface and a subsurface soil sample were collected from 15 randomly-selected sampling locations from a sampling grid superimposed over the unit. The soil samples were analyzed for VOCs, SVOCs, pesticides, herbicides, PCBs and metals. Results were compared to the Oak Ridge National Laboratory (ORNL) Regional Screening Levels (RSLs) for Residential Soil and Protection of Groundwater (PGW) dated July 7, 2008. The results of the risk-based screening for SWMU No. 10 are summarized below:

- None of the VOC concentrations exceeded applicable Residential RSLs. Chloromethane and naphthalene had estimated (J-flagged) concentrations above established PGW screening levels. There were no established RSLs for iodomethane, which was detected at low concentrations in some of the samples.
- SVOCs were detected in most of the surface samples, but in only one of the subsurface soil samples. Five SVOCs were present at concentrations exceeding the applicable residential RSL: benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[a,h]anthracene, and indeno(1,2,3-c,d)pyrene. All of the SVOCs with concentrations exceeding the Residential RSL also exceeded the PGW RSL. One additional SVOC, naphthalene, also had concentrations (all J-flagged) above the PGW RSL. Several SVOCs detected did not have any established RSLs (acenaphthylene, benzo[g,h,i]perylene, benzo[k]fluoranthene, di-n-octylphthalate, and phenanthrene. With the exception of phenanthrene, all reported concentrations were J-flagged.
- Pesticide organics were detected in several surface samples and in one subsurface soil sample. However, only two, dieldrin and toxaphene, had concentrations above the Residential RSLs and all concentrations of dieldrin were J-flagged. Pesticides with reported concentrations exceeding established PGW RSLs included the following compounds: alpha-hch(beta-BHC), technical-hch(delta-BHC), 4,4-DDT, dieldrin, and toxaphene. As mentioned above, dieldrin concentrations were all J-flagged, as were those for alpha-hch(beta-BHC) and technical-hch(delta-BHC). Endrin aldehyde and endosulfan sulfate, all reported as J-flagged do not have established PGW RSLs.
- PCBs were detected in about half of the surface soil samples but in no subsurface soil samples. The PCBs detected at concentrations above the PGW RSL included Aroclor-1248, Aroclor-1254 and Aroclor-1260. The highest concentration of Aroclor-1254 also

exceeded the Residential RSL

- All targeted metals (antimony, arsenic, barium, beryllium, cadmium, chromium (total), cobalt, copper, lead, nickel, selenium, silver, thallium, tin, vanadium, zinc and mercury) were inconsistently detected in the soil samples (as expected due to their natural occurrence). Background sampling was not performed as part of the Phase I RFI. Metals with concentrations above residential RSLs included antimony, arsenic, cadmium, cobalt, vanadium, and zinc. Copper, cadmium, and zinc were also present in laboratory method blanks, although the maximum concentrations in samples exceeded five times the blank concentration. With the exception of mercury, none of the targeted metals had established PGW RSLs. Cobalt has neither an established Residential RSL nor a PGW RSL. The presence of silver could be laboratory-related as concentrations in samples were less than five times those in the method blank

For assessing SWMU No. 10, one surface and one subsurface soil sample was collected from fifteen randomly selected sampling locations from a sampling grid superimposed over the unit. Groundwater was sampled at two locations. Soil results were compared to the July 7, 2008 ORNL RSLs for Residential Soil and PGW. Groundwater analytical results were compared to EPA MCLs, or if no EPA MCL was established, the ORNL RSLs for tapwater (dated July 7, 2008). The results are summarized below.

- At all of the fifteen soil sample locations, surface soil samples had detectable concentrations of VOCs. None of the VOC concentrations exceeded Residential RSLs. Four VOCs, benzene, chloromethane, methylene chloride and naphthalene, were detected at levels above established PGW RSLs. Benzene and naphthalene, common petroleum constituents, were attributed to the AST area (SWMU 7) located adjacent to the SWMU 10. Petroleum odor was observed during the assessment, and TPH GRO and DRO were identified in one of the soil samples. Iodomethane, was present at J-flagged concentrations, but had no established Residential RSL or PGW RSL.
- None of the detected pesticides were present in soil at concentrations exceeding the Residential RSLs and only two, beta-hch(beta-BHC) and technical-hch(delta-BHC), were present at concentrations above the PGW RSLs. The concentrations of beta-hch were J-flagged.
- A low concentration of the herbicide 2,4,5-T was detected at one soil sample location. The concentration was below the Residential RSL and PGW RSL.
- All soil sample locations had detectable concentrations of metals. Concentrations of antimony, arsenic, lead, thallium, and vanadium were above the Residential RSL. The maximum concentration of mercury was above the PGW RSL. There were no established Residential RSLs or PGW RSLs for cobalt. There were no PGW RSLs established for the remaining 13 detected metals (antimony, arsenic, barium, beryllium, chromium, copper, lead, nickel, selenium, silver, thallium, vanadium, and zinc)
- The groundwater sample results revealed low levels of VOCs. Two of these VOCs, acetone and methylene chloride, are common laboratory artifacts, but nonetheless, the concentrations were each below all risk-based screening levels. The remaining detected constituents (naphthalene, toluene, and m/p xylene) are common petroleum constituents and were attributed to the nearby AST area (SWMU 7). Metals were the only other analytes detected. Barium, beryllium, lead, and vanadium concentrations were above the

Tapwater RSL or EPA MCL. Barium and beryllium were also present in the method blank. Cobalt was detected but there were no PGW screening levels available for cobalt. Since the samples were procured from temporary one-inch monitoring wells, results were likely biased high by sample turbidity.

Post-RFI Activities

The following provides a summary of additional assessment and regulatory activity subsequent to submittal of the Phase I RFI Report.

VDOT elected to address the impacts to soil identified in SWMU 9 during past investigation of this unit through Interim Measures (IMs). On December 9, 2009, VDOT submitted "Interim Measure Remediation Work Plan – Former Equipment and Battery Storage Area" to VADEQ. The document proposed excavation and off-site disposal as the IM to effectively remediate the soil to levels that would support clean closure of the unit

On November 10, 2010, VDOT submitted revised versions of Tables 3 and 5 from the Phase I RFI Report. These tables provided results of the preliminary risk-based screening for constituents identified in soil at SWMU 7 and SWMU 10, and incorporated the ORNL RSLs updated in May of 2010. In addition to comparison to the updated Residential Soil RSLs and Protection of Groundwater RSLs as was performed for inclusion in the Phase I RFI Report, comparison against Industrial Soil RSLs was also performed.

As recommended in the Phase I RFI Report, on December 20, 2010, a permanent two-inch groundwater monitoring well was installed at the former location of TW-5 at SWMU No. 10 in order to further evaluate the concentrations of barium, beryllium, cobalt, lead, and vanadium. The well was developed, then purged and sampled using low-flow methodology. The sample was then analyzed for the referenced metals. Barium and cobalt were the only targeted constituents that were detected in the sample at concentrations above the laboratory method detection limits (MDLs). The concentration of cobalt was between the MDL and laboratory reporting limit (RL), and therefore, the reported concentration was estimated ("J-flagged"). Barium was also detected in the laboratory method blank; the concentration reported for the sample was less than five times the concentration detected in the blank. The results for barium and cobalt were compared to the lower of the EPA MCL and ORNL RSL for tapwater, concentrations of both barium and cobalt were below the screening levels. The investigation procedures and results were submitted to VADEQ in a January 20, 2011 report titled "Results of Well Installation and Sampling, SWMU #10 – Suspect Waste Disposal Area". The report recommended no further action to address groundwater at SWMU 10.

April 8, 2011 VADEQ Comments

On April 8, 2011, VADEQ provided review comments to VDOT on the Phase I RFI Report, the November 4, 2010 revised risk-based screening tables, and the January 20, 2011 report referenced above in Section 3.2.5.2. The letter, included in Appendix A for reference, stated that the three submittals were approved as complete, and provided the following comments regarding conducting further actions at the site for the SWMUs assessed to date as part of the Phase I RFI.

- Comment 1: VADEQ approved removal of SWMUs 1 through 5 from further

consideration and investigation

- Comment 2: VADEQ requested a confirmatory sample in the location of TW-3 at SWMU 7 to further evaluate the presence of benzene at levels slightly above the EPA MCL.
- Comment 3: VADEQ requested an Interim Measures (IM) Work Plan or CMS evaluating remedies to address the presence of lead and other VOCs at levels above both the residential and industrial screening levels in the surface soils at SWMU 8.
- Comment 4: VADEQ requested implementation of the IM Work Plan for SWMU 9
- Comment 5: Since concentrations of contaminants of concern (COCs) in soil exceeded the Residential RSLs at SWMU 10, VADEQ requested further action to address the exceedances based on one or more of the following options: removal action, collection of additional background and unit samples; statistical evaluation against background concentrations; quantitative risk assessment, restrict land use to industrial use only, including an evaluation of the future land use scenario.
- Comment 6: VADEQ accepted VDOT's recommendation of no further action to address metals in groundwater at SWMU 10
- Comment 7: VADEQ requested collection of a confirmatory groundwater sample from the permanent monitoring well installed at SWMU 10 to further evaluate the presence of naphthalene at concentrations slightly above the RSL.

June 30, 2011 VDOT Response to Comments

VDOT responded to the April 8, 2011 VADEQ comments in correspondence dated June 30, 2011. The pertinent action items proposed by VDOT in this correspondence were as follows:

- Installation and sampling of a permanent monitoring well at SWMU 7 to confirm the detection of benzene in groundwater at levels above the EPA MCL
- Submit an Evaluation of Potential Future Land Use to request approval from VADEQ to use industrial land use assumptions in future remedy selection
- Perform additional soil investigation at SWMUs 7 and SWMU 8, with the scope of work and schedule dependent on VADEQ's ruling on industrial land use assumptions
- VDOT reiterated intent to implement the IMWP for SWMU 9, and requested that implementation be delayed until interim or corrective measures for SWMUs 7 and 8 were determined so that actions could be performed concurrently
- VDOT also provided additional argument that the source of naphthalene detected in soil and groundwater at SWMU 10 was not related to that unit and requested no further action be required to address naphthalene

VADEQ issued a response to VDOT's June 30, 2011 comments in a letter dated September 20, 2011. VADEQ agreed with all of VDOT's comments with the exception of the request for no further action to address naphthalene at SWMU 10. VADEQ requested confirmatory groundwater sampling at SWMU 10 for naphthalene.

Confirmation Sampling for Naphthalene at SWMU 10

On November 9, 2011, VDOT performed confirmation sampling of the permanent monitoring well installed at SWMU 10 (MW-SWD-1) employing low-flow methodology. The results of the sampling indicated that the concentration of naphthalene was below the ORNL RSL for Tapwater. The results were summarized in the November 15, 2011 report titled "Confirmation Sampling and Analysis for Naphthalene, Solid Waste Management Unit No. 10 (Suspect Waste Disposal Area). On May 29, 2012, in consideration of pending approval for industrial land use assumptions at the facility, VADEQ approved no further action to address SWMU 10.

Evaluation of Potential Future Land Use

On December 6, 2011, VDOT submitted current and potential future land use documentation to support use of an industrial land use assumption for determining appropriate measures to undertake at the facility during the RCRA Corrective Action process. The information provided was as specified in the document titled "Virginia DEQ, RCRA Corrective Action Fact Sheet #1 "Land Use Assumptions for RCRA Corrective Action Baseline Risk Assessments (updated 6/7/2010". VDOT also submitted to VADEQ, an example deed restriction on July 5, 2012. VADEQ approved use of industrial land use assumptions as per correspondence dated July 26, 2012. In this correspondence, VADEQ also requested a schedule for implementation of the additional investigations that VDOT specified in the June 30, 2011 correspondence referenced above for SWMU 8, and confirmatory groundwater sampling for naphthalene at SWMU 7.

Additional Investigations at SWMU 7 and SWMU 8

As per VDOT correspondence dated August 23, 2012, additional investigations were performed in October 2012 to assess benzene levels in groundwater at SWMU 7, and to perform chromium speciation in soil at SWMU 8 to complete Action Items 2 and 3 outlined in the August 23, 2012 letter. The results were summarized in the November 27, 2012 report titled "Results of Phase I RFI Follow-up Actions, Action Item 2: Chromium Speciation – SWMU No. 8, Action Item 3: Confirmatory Groundwater Sampling – SWMU No. 8. The results of the investigations confirmed that the levels of benzene in groundwater at SWMU 7 were slightly above the EPA MCL, and that hexavalent chromium was present in the surface soil at SWMU 8. In addition to Action Items 2 and 3, VDOT had also proposed three additional action items as summarized below:

- Action Item 1: After completing Action Item 4, perform evaluation of metals concentrations at SWMU 8 in accordance with VADEQ's RCRA Corrective Action Fact Sheet # 5 "Inorganic Background Determinations for Soil During RCRA Corrective Action Investigations".
- Action Item 4: Conduct further assessment of COCs in surface and subsurface soil at SWMU 8, and also assess soil for parameters to evaluate transfer to groundwater, as warranted.
- Action Item 5: VDOT reiterated intent to address SWMU9 via implementation of the December 9, 2009 "Interim Measures Remediation Work Plan" as previously stated in the June 30, 2011 letter referenced above.

On December 6, 2012, VADEQ issued correspondence via electronic mail indicating that the agency had reviewed the November 27, 2012 report referenced above. VADEQ also

documented discussions during a December 5, 2012 conference call conducted by VADEQ and VDOT, during which it was concluded by both parties to forgo additional investigation at SWMU 8 and move towards performing soil removal as an IM at this unit along with implementation of the IMWP at SWMU 9. In addition, other discussions were conducted regarding options to address benzene in groundwater at SWMU 7. Options discussed included collection of independent groundwater samples and long-term monitoring.

Monitoring of Benzene at SWMU 7

To address the detection of benzene in groundwater at concentrations slightly above the EPA MCL during the Phase I RFI follow-up actions discussed above, VDOT elected to conduct four independent groundwater monitoring events at MW-BSA-1 to further evaluate the concentration of benzene in groundwater at this unit. The results for all four monitoring events were below the EPA MCL for benzene. On July 1, 2013, a report titled "Evaluation of Benzene in Groundwater at MW-BSA-1 SWMU 7" was submitted to VADEQ to present the results from these monitoring events. The report recommended that SWMU 7 be removed from further assessment and/or corrective action requirements. On July 2, 2013, VADEQ issued correspondence approving this recommendation.

During evaluation of alternatives for IMs at SWMU 8 and related discussions with VADEQ, it was decided to forego IMs and develop the Corrective Measures Study (CMS) for the facility as documented in the March 25, 2013 e-mail correspondence from VADEQ to VDOT. At this juncture, eight of the ten SWMUs identified at the facility (SWMU Nos. 1-7 and 10) have received a "no further action required" ruling from VADEQ, and were therefore excluded from consideration during the subsequent remedy evaluation and selection components of the CMS. Accordingly, the CMS was prepared to evaluate and select remedies to address environmental impacts associated with SWMU Nos. 8 and 9. The CMS document (May 31, 2013, Revised August 1, 2013) was approved by VADEQ on December 18, 2013. The selected remedies for these SWMUs are outlined in Module VI.

ATTACHMENT B

SITE MAPS

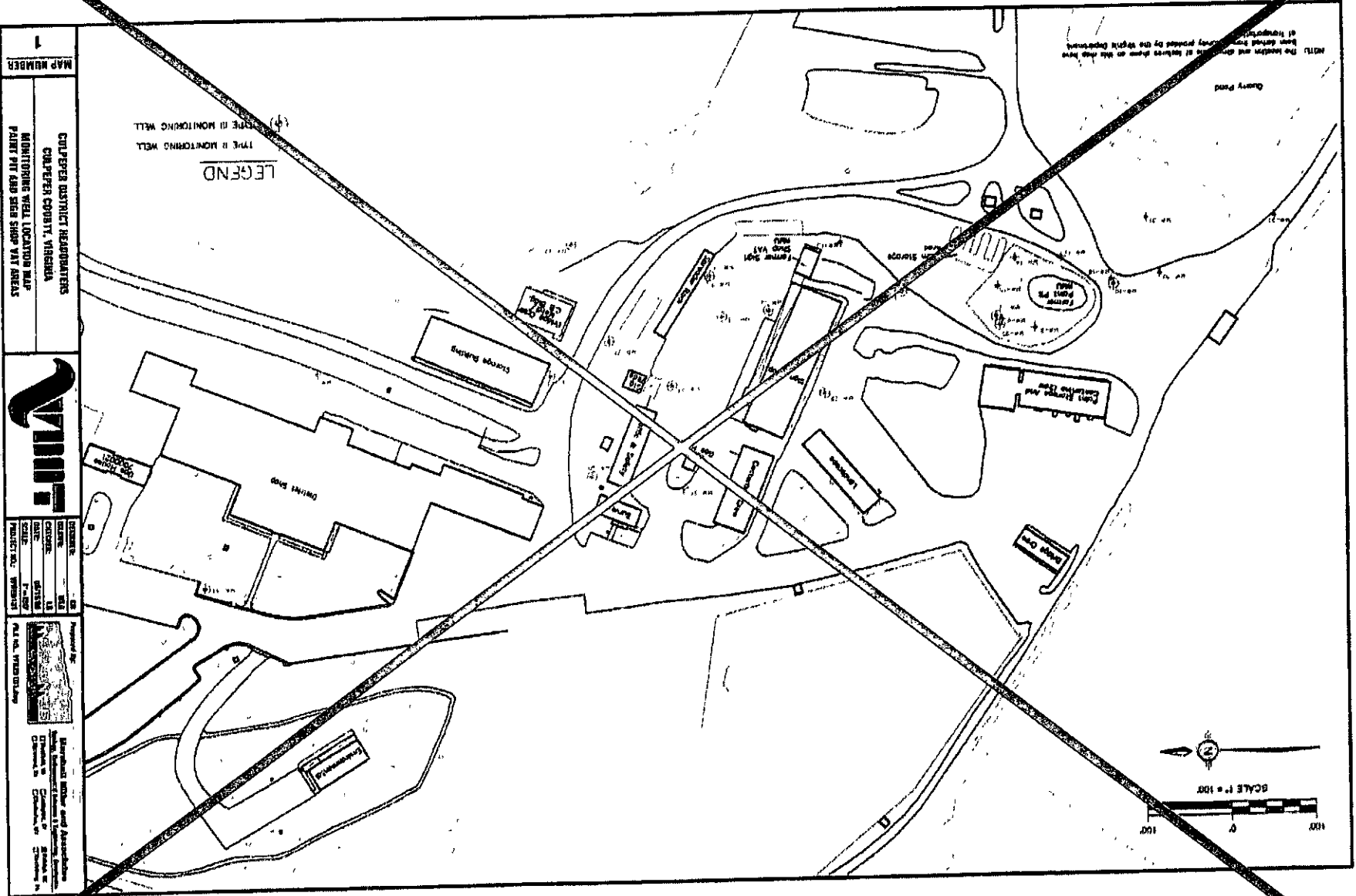
CULPEPER DISTRICT HEADQUARTERS

Map No. B-1, Monitoring Well Location Map, dated ~~6/15/2006~~5/5/2014

Map No. B-2, Groundwater Flow Map, dated ~~6/19/2009~~5/5/2014

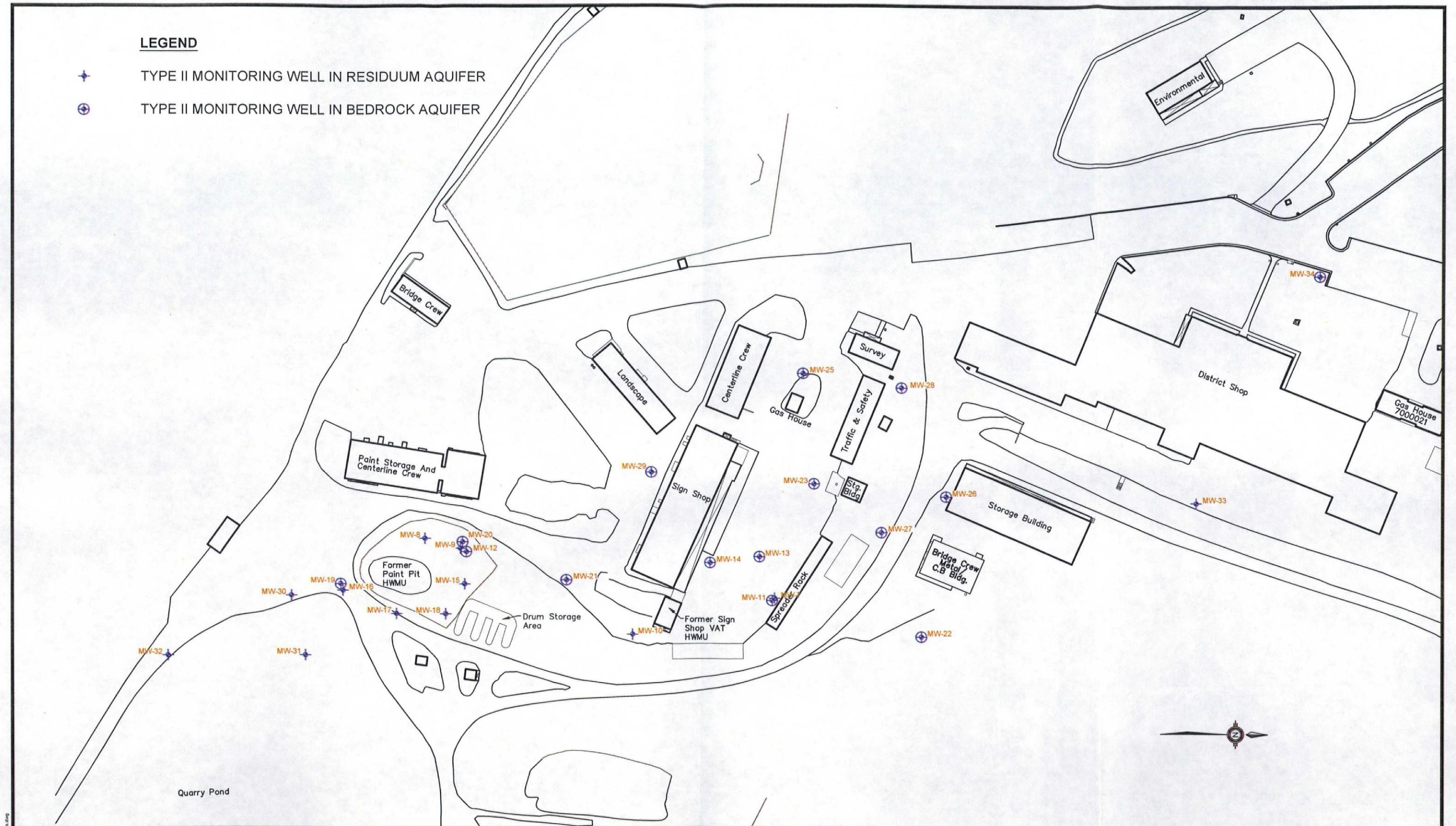
Map No. B-3, Facility Location Map, dated 5/5/2014

Map No. B-4, Facility Layout, dated 5/5/2014

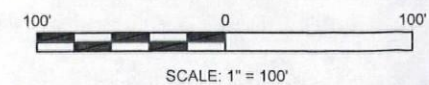


LEGEND

- TYPE II MONITORING WELL IN RESIDUUM AQUIFER
- TYPE II MONITORING WELL IN BEDROCK AQUIFER



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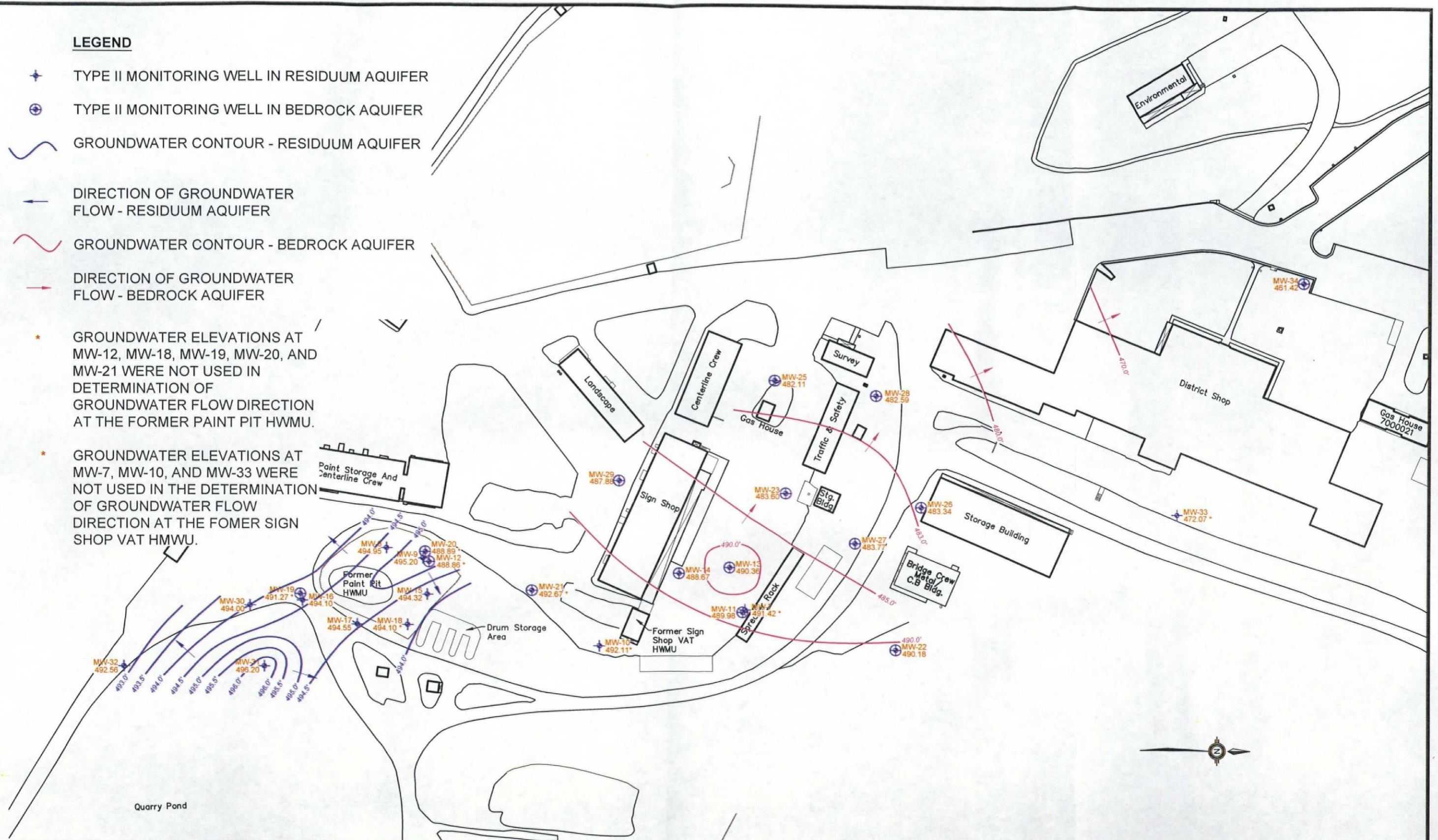


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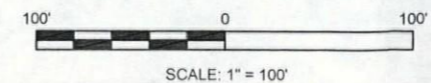
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- TYPE II MONITORING WELL IN BEDROCK AQUIFER
- GROUNDWATER CONTOUR - RESIDUUM AQUIFER
- DIRECTION OF GROUNDWATER FLOW - RESIDUUM AQUIFER
- GROUNDWATER CONTOUR - BEDROCK AQUIFER
- DIRECTION OF GROUNDWATER FLOW - BEDROCK AQUIFER

* GROUNDWATER ELEVATIONS AT MW-12, MW-18, MW-19, MW-20, AND MW-21 WERE NOT USED IN DETERMINATION OF GROUNDWATER FLOW DIRECTION AT THE FORMER PAINT PIT HWMU.

* GROUNDWATER ELEVATIONS AT MW-7, MW-10, AND MW-33 WERE NOT USED IN THE DETERMINATION OF GROUNDWATER FLOW DIRECTION AT THE FORMER SIGN SHOP VAT HWMU.



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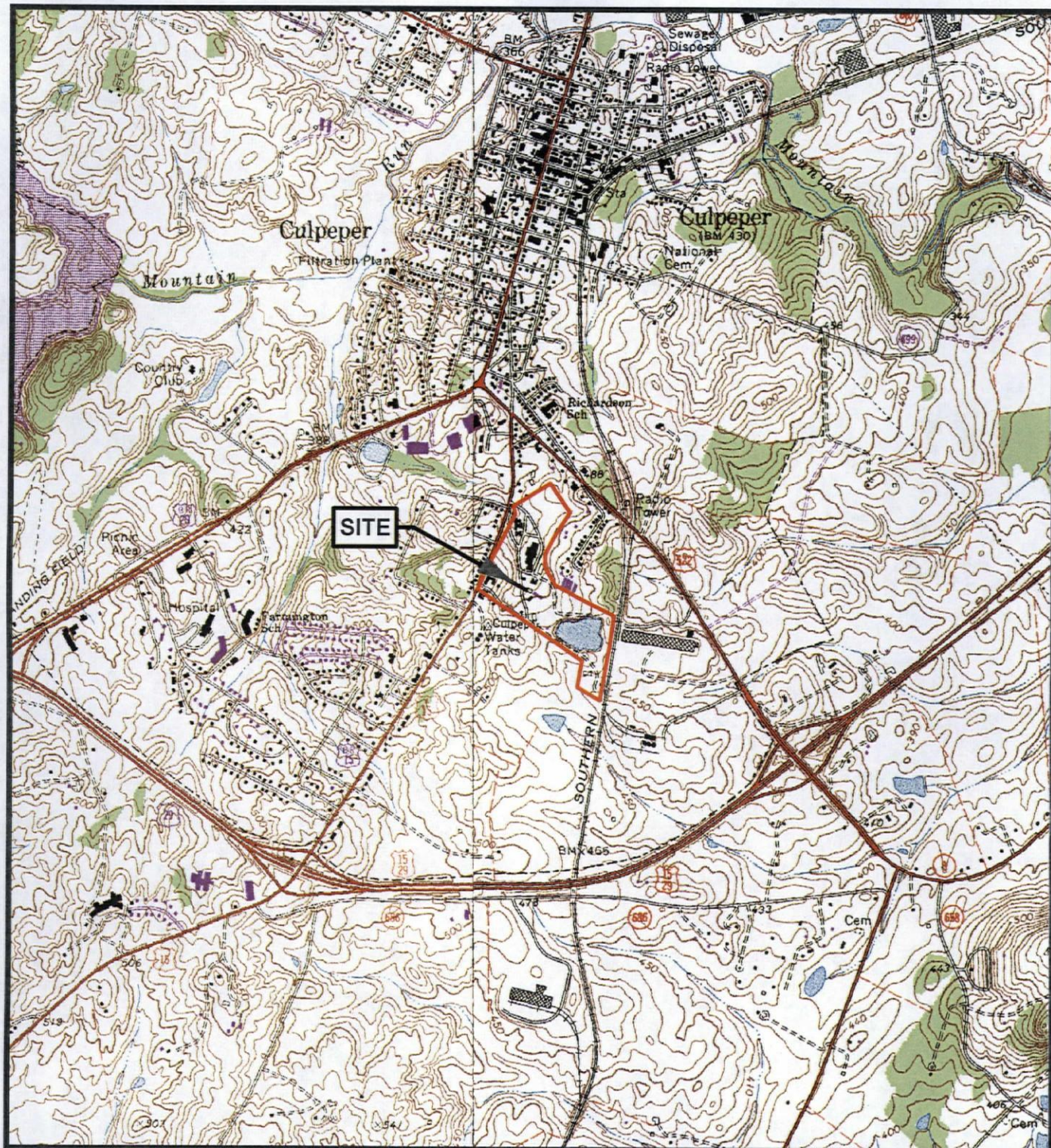


CULPEPER DISTRICT HEADQUARTERS
CULPEPER COUNTY, VIRGINIA

GROUNDWATER FLOW MAP
(DECEMBER 19, 2013)

FIGURE

B-2



USGS 7.5' CULPEPER EAST, VA QUADRANGLE - 1973

FIGURE B-3



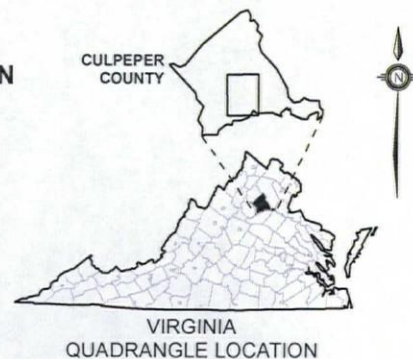
SOURCE:
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 - Photorevised 1978, Photinspected 1981
 Culpeper West, VA 1971
 - Photorevised 1979

PROJECT NO.: VCEN241
 DATE: 5/5/2014
 OFFICE LOCATION: Raleigh

VIRGINIA DEPARTMENT OF TRANSPORTATION
 CULPEPER DISTRICT HEADQUARTERS
 1601 ORANGE ROAD
 CULPEPER, CULPEPER COUNTY, VIRGINIA

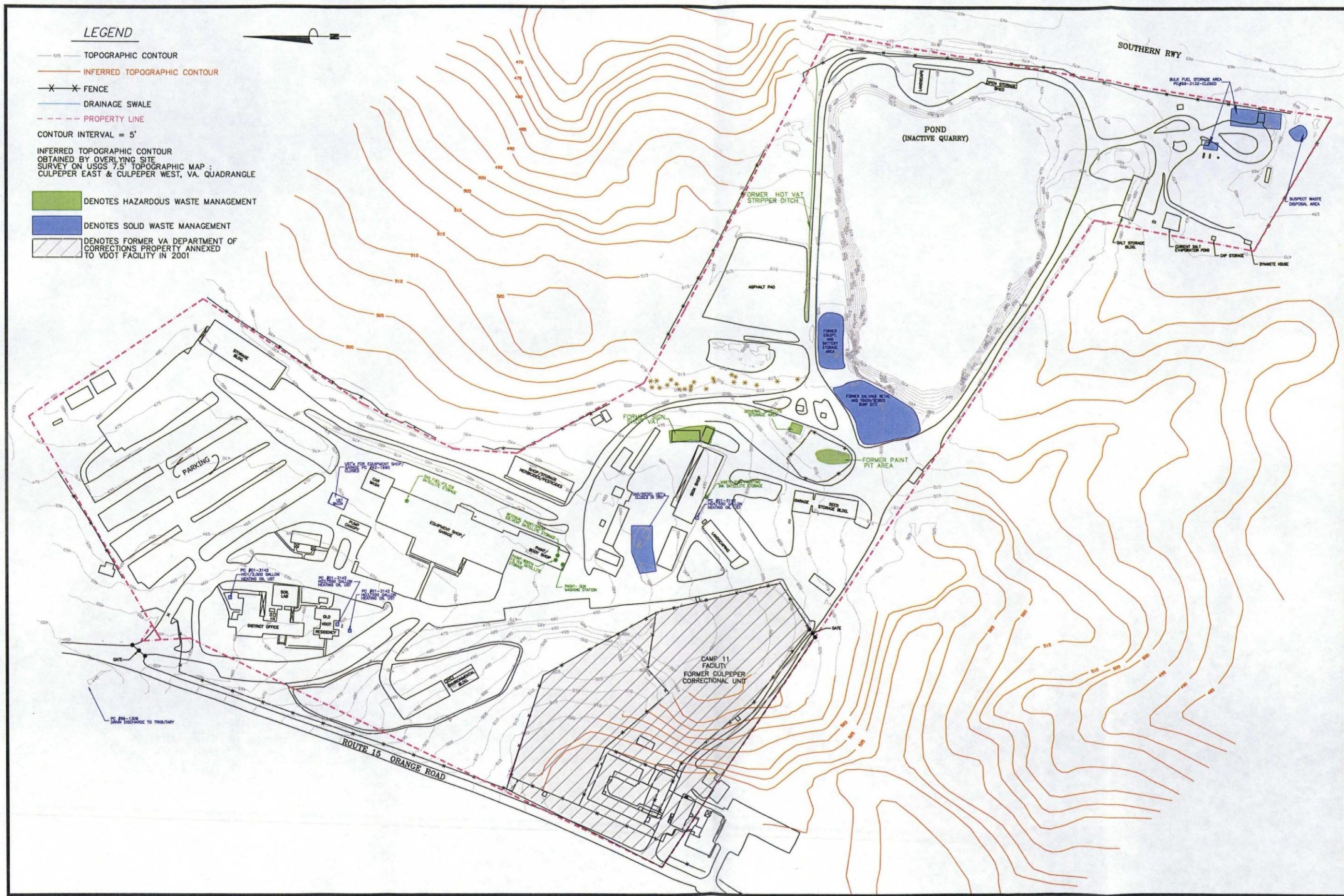
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FACILITY LOCATION MAP



LEGEND

- TOPOGRAPHIC CONTOUR
- INFERRED TOPOGRAPHIC CONTOUR
- FENCE
- DRAINAGE SWALE
- PROPERTY LINE
- CONTOUR INTERVAL = 5'
- INFERRED TOPOGRAPHIC CONTOUR OBTAINED BY OVERLYING SITE SURVEY ON USGS 7.5' TOPOGRAPHIC MAP : CULPEPER EAST & CULPEPER WEST, VA. QUADRANGLE
- DENOTES HAZARDOUS WASTE MANAGEMENT
- DENOTES SOLID WASTE MANAGEMENT
- DENOTES FORMER VA DEPARTMENT OF CORRECTIONS PROPERTY ANNEXED TO VDOT FACILITY IN 2001



DESIGNED:	LG	WG	LG
DRAWN:	LG	WG	LG
CHECKED:	LG	WG	LG
DATE:	5/5/12	5/5/12	5/5/12
SCALE:	1"=100'	1"=100'	1"=100'
FILE NO.:	VDOT CULPEPER	VCEN241	RALEIGH
PROJECT NO.:			
OFFICE LOC.:			

VDOT CULPEPER DISTRICT HEADQUARTERS
1601 ORANGE ROAD
CULPEPER, VIRGINIA

FACILITY LAYOUT

FIGURE

B-4

ATTACHMENT E

POST-CLOSURE PLAN:
CLOSED HAZARDOUS WASTE MANAGEMENT UNITS

ATTACHMENT E

POST-CLOSURE PLAN: CLOSED HAZARDOUS WASTE MANAGEMENT UNITS

A. INTRODUCTION

- A.1 Post-closure care shall continue for 30 years after certification of closure (September 13, 2000) and consists of monitoring and reporting in accordance with the requirements of 40 CFR Part 264 and **Permit Part V**.
- A.2 Use of the property subject to this post-closure care plan shall never, during the post-closure care period, be allowed to disturb the integrity or the function of the facility's monitoring system unless the facility demonstrates to the Director that the disturbance:
- a. Is necessary to the proposed use of the property and will not increase the potential hazard to human health or the environment; or
 - b. Is necessary to reduce the threat to human health or the environment.

Such use will require the written permission of the Director prior to implementation.

B. INSPECTION AND MAINTENANCE SCHEDULE

B.1 Benchmarks

Benchmarks were installed to act as points of reference for locating the monitoring wells and determining the groundwater potentiometric surface. Benchmarks were installed by a certified land surveyor. Their location and elevation are tied into the property boundary and are recorded in the deed to the property. The Permittee shall inspect annually for defective or disturbed benchmarks and note changes. If the benchmarks have been disturbed, then the benchmarks shall be resurveyed. The location and elevation of the benchmarks shall be determined annually and any changes noted in the log book. The benchmark shall be inspected semiannually for any disturbance and maintained as necessary to sustain their intended use.

B.2 Groundwater monitoring wells

At least semiannually, inspect and maintain all monitoring wells and piezometers to sustain their original intended purpose. Monitoring well locking caps shall be locked at all times except when the monitoring wells are being sampled or maintained. Protective concrete aprons shall be inspected for subsidence and breakage. Monitoring wells shall be replaced or repaired as necessary (for diagram see **Permit Attachment I, Appendix 5**)

B.3 Security

Adequate security shall be maintained to prohibit unauthorized access to the site.

B.4 Records

All inspections shall be logged and ~~detailed inspection reports written~~ documentation provided in each annual Corrective Action Program annual groundwater monitoring report, which ~~The logged reports of each inspection~~ shall be maintained at the facility during the entire post-closure care period. The inspection results and groundwater sampling and analysis results shall be available at the facility for the Department of Environmental Quality representatives during periodic on site inspections of the facility.

C. FACILITY CONTACT

The post-closure care contact representative for the Culpeper site is noted below:

Mr. Ed Wallingford
Virginia Department of Transportation
Environmental Division
1401 East Broad Street
Richmond, Virginia 23219
Phone: (804)-371-6824

The facility copy of the Post-Closure Plan is maintained in the facility files at the Culpeper site in Culpeper, Virginia. Mr. Wallingford is responsible for storage and updating of the Post-Closure Plan during the post-closure period.

APPENDIX 1
CERTIFICATION OF CLOSURE

ATTACHMENT F
SECURITY PROVISIONS

ATTACHMENT F

SECURITY PROVISIONS

Security of the entire site is maintained by a barrier system consisting of a six-foot chainlink fence and gate, which provides personnel and equipment access for maintenance. The location of the fence is shown on **Attachment B**. The gate is open during normal operational hours, but otherwise locked. ~~Signs are posted every 150 feet along the fence with the following warning: "Danger Keep Out Authorized Personnel Only". There is no land-based unit because they were clean closed for soils-~~ Groundwater monitoring wells are locked at all time except when the monitoring wells are being sampled or maintained.

ATTACHMENT G
INSPECTION REQUIREMENTS

ATTACHMENT G

INSPECTION REQUIREMENTS

A. HIGHLIGHTS

In accordance with 40 CFR 264.15, the Permittee is to follow a written inspection schedule observing malfunction, deterioration, or operational errors in the monitoring systems for the waste management units; implement remedial action when necessary; and maintain a signed and dated inspection log at the facility and available to the DEQ upon request which provides inspection observations, deficiencies noted, and corrective action taken (an example of inspection logs containing the minimum information are depicted in Appendices 1 and 2 of this Attachment). The Permittee is to inspect, at the frequency specified for the following as noted below:

- B. The Permittee shall inspect ~~semiannually~~ for damage to groundwater monitoring wells and piezometers (i.e., unlocked protective cover, unsecured protective casing, damaged well and/or defective concrete pad) during each groundwater monitoring event.
- C. The Permittee shall inspect during sampling for unsatisfactory performance or operational deficiencies of the wells and piezometers (obstructions, bends, excess sediment accumulation, grout erosion, inadequate yield, etc.).

D. ANNUAL INSPECTIONS

The Permittee shall inspect annually for defective or disturbed benchmarks and note changes ~~If the benchmarks have been disturbed, then the benchmarks shall be resurveyed to determine location of the benchmarks and note changes at least annually.~~

APPENDIX 1
EXAMPLE SEMIANNUAL INSPECTION LOG

Note: a separate inspection sheet is required for each monitoring well.

MONITORING WELL: _____

A. Inspected by (full name): _____

B. Date/Time of Inspection: _____

C. Inspection Observations: _____

C.1 Locking protective casing: _____

C.2 Concrete well Pad: _____

C.3 Lock: _____

C.4 Erosion: _____

C.5 Exterior well identification number: _____

Inspection Comments: _____

Repair/remediation Comments: _____

F. Repair/remediation Date: _____

APPENDIX 2
EXAMPLE ANNUAL INSPECTION LOG

ANNUAL INSPECTION-BENCHMARK VERIFICATION

A. Inspected by (full name): _____

B. Date/Time: _____

C. Inspection Observations: _____

D. Determine location of all benchmarks and note changes: _____

E. Attach results of benchmark survey.

F. Repair/remediation Comments: _____

G. Repair/remediation Date: _____

ATTACHMENT M

**LIST AND DESCRIPTIONS OF KNOWN SOLID WASTE MANAGEMENT UNITS
(SWMUS) HAZARDOUS WASTE MANAGEMENT UNITS (HWMUS)
AND AREAS OF CONCERN (AOCS)**

ATTACHMENT M

**LIST OF KNOWN SOLID WASTE MANAGEMENT UNITS,
HAZARDOUS WASTE MANAGEMENT UNITS, AND
AREAS OF CONCERN**

The list of solid waste management units (SWMUs), hazardous waste management units (HWMUs), and areas of concern (AOCs) for VDOT's Culpeper site (EPA ID No. VAD980715064), is identified in Attachment M, Table M-1 and in Attachment B, Figure MB-14, Site Map/Facility Layout. This list of SWMUs, HWMUs and AOCs is based upon a Post Closure Care Permit Application (PCCP) dated March 15, 2001, and revised January, April, and August 2002.

The PCCP serves as the Department's SWMU identification review for the above facility until the site-wide RCRA Facility Investigation has been completed. A Phase I RCRA Facility Investigation Work Plan (Phase I RFI) is required by the Department subsequent to the issuance of this Permit. A Phase I RFI is then required by the Department.

Detailed historical information and descriptions of SWMUs, HWMUs and AOCs are in the PCCP Report, dated March 15, 2001. The PCCP Report and the forthcoming RFI Work Plan will be maintained as part of the administrative record at the Office of Waste Permitting, Waste Division, Virginia Department of Environmental Quality (DEQ), 629 East Main Street, P.O. Box 40009, Richmond, Virginia, 23240-0009.

Table M-1

List and Descriptions of SWMUs, HWMUs, and AOCs

- ~~1. HWMU No. 1, Hot Vat Stripper Ditch~~
- ~~2. HWMU No. 2, Sign Shop Vat~~
- ~~3. HWMU No. 3, Paint Pit~~
- ~~4. SWMU No. 1, Closed Heating Oil UST (HO1)~~
- ~~5. SWMU No. 2, Closed Heating Oil UST (HO2)~~
- ~~6. SWMU No. 3, Closed Heating Oil UST (HO3)~~
- ~~7. SWMU No. 4, Closed Heating Oil UST (HO4)~~
- ~~8. SWMU No. 5, Closed Gas/Diesel USTs at Equipment Shop/Garage~~
- ~~9. SWMU No. 6, Closed Gas/Diesel USTs at Sign Shop Area~~
- ~~10. SWMU No. 7, Closed Gas/Diesel ASTs at Bulk Storage Area~~
- ~~11. SWMU No. 8, Former Salvage Metal and Trash/Debris Dump Site~~
- ~~12. SWMU No. 9, Former Equipment and Battery Storage Area~~
- ~~13. SWMU No. 10, Suspect Waste Disposal Area (Near Bulk Fueling Area)~~

1. HWMU No. 1: Hot Vat Stripper Ditch

HWMU No. 1, classified as a surface impoundment, was a shallow, narrow, surface drainage swale approximately 600 feet in length. An alkaline solution (pH of 14) from an equipment cleaning unit was reportedly periodically discharged into the surface drainage swale. Risk-based closure of the unit was completed for both soil and groundwater.

2. HWMU No. 2: Sign Shop Vat

HWMU No. 2, classified as a surface impoundment, was constructed analogous to a septic system with a tank constructed of concrete block connected to a subsurface drain field. Solvent used for stripping coatings from road signs was discharged into the tanks on an annual basis for a period of four years prior to 1980. The HWMU was closed via removal of the components and impacted soil. Residual groundwater impacts are being addressed via Module VII of this permit.

3. HWMU No. 3, Paint Pit

HWMU No. 3, classified as a landfill, was an area where containerized paint products were disposed in the subsurface in the late 1970's. The containers and impacted soil were excavated and removed in the early to mid 1990's. Subsequent soil sampling was performed verifying clean-closure of the unit for soil. Residual impacted groundwater is being addressed via Module VII of this permit.

4. SWMU No. 1: Closed Heating Oil UST (HO1)

SWMU No. 1 was a 2,000-gallon capacity underground storage tank (UST) used for storing virgin heating oil. The UST was constructed of steel. The installation date was unknown and the UST was closed via removal in August/September 2000.

5. SWMU No. 2: Closed Heating Oil UST (HO2)

SWMU No. 2 was a 550 gallon capacity UST used for storing virgin heating oil. The UST was constructed of steel. The installation date was unknown and the UST was closed via removal in August/September 2000.

6. SWMU No. 3: Closed Heating Oil UST (HO3)

SWMU No. 3 was a 550-gallon capacity UST used for storing virgin heating oil. The UST was constructed of steel. The installation date was unknown and the UST was closed via removal in August/September 2000.

7. SWMU No.4: Closed Heating Oil UST (HO4)

SWMU No. 4 was a 550-gallon capacity UST used for storing virgin heating oil. The UST was constructed of steel. The installation date was unknown and the UST was closed via removal in August/September 2000.

8. SWMU No. 5 Closed Gas/Diesel USTs at Equipment Shop/Garage

SWMU No. 5 consisted of four steel USTs including capacities of 10,000 gallons and 2,000 gallons for storage of virgin gasoline, and 2,000 gallons and 1,500 gallons for storage of virgin diesel fuel. The installation date was unknown and the USTs were closed via removal in May of 1992.

9. SWMU No. 6 Closed Gas/Diesel USTs at Sign Shop Area

SWMU No. 6 consisted of three steel USTs including capacities of 1,000 gallons and 2,000 gallons for storage of virgin gasoline, and 10,000 gallons for storage of virgin diesel fuel. The 1,000-gallon gasoline UST and the 10,000-gallon diesel fuel UST were installed Circa 1977, and the 2,000-gallon gasoline UST was installed Circa 1961. The three USTs were closed via removal in September of 1997.

9. SWMU No. 7: Closed Gas/Diesel ASTs at Bulk Storage Area

SWMU No. 7 included six steel above-ground storage tanks (ASTs) including three 20,000-gallon and one 18,000-gallon ASTs used for storage of virgin diesel fuel, and two 20,000-gallon ASTs used for storage of virgin gasoline. The installation date was unknown, and the ASTs were close by removal in February of 1996.

10. SWMU No. 8: Former Salvage Metal and Debris Storage Site

SWMU No. 8 was defined as an accumulation area for salvage metal and other debris and is approximately one-half acre or less in size. The specific quantities and types of materials staged in this area are unknown and the precise dates of operation were not known; although accumulation activity was visible in aerial photographs dated from 1960 to 1963.

11. SWMU No. 9: Former Equipment and Battery Storage Area

SWMU No. 9 was an equipment and battery storage area occupying about 0.14 acres. An inventory of items stored in the area was not available, but batteries were certainly a component of these materials as evidence of battery parts were observed during previous assessment/corrective action activities undertaken at the unit. The dates of operation were undetermined.

12 SWMU No. 10 Suspect Waste Disposal Area (Near Bulk Fuelling Area)

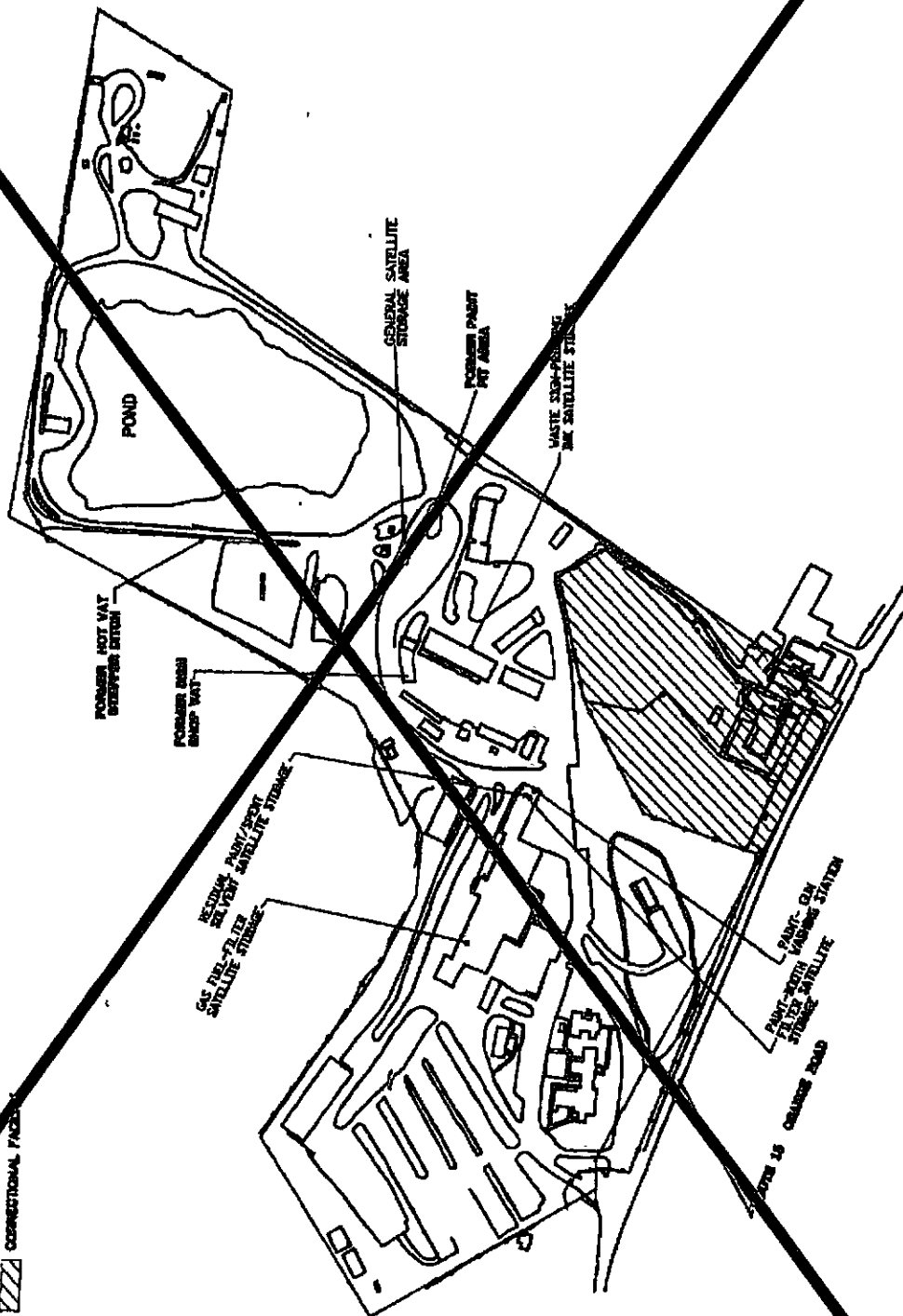
SWMU No. 10 was a potential waste disposal area identified through interviews with VDOT personnel. According to these interviews, previous equipment cleaning operations may have occurred in the area. The cleaning included equipment used for application of paints, pesticides and herbicides. Information regarding dimensions and dates of operation was not available.

Note HWMUs and former HWMUs are identified in bold text

FIGURE M-1
SITE MAP

LEGEND

- FENCE
- DRAINAGE CANAL
- PROPERTY LINE
- CORRECTIONAL FACILITY

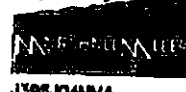


**HAZARDOUS WASTE PERMIT
APPLICATION - PART A
ITEM XVI - FACILITY DRAWING**

VIRGINIA DEPARTMENT OF TRANSPORTATION
1601 ORANGE ROAD
CULPEPER COUNTY
EPAID NO. VAD980715064

DATE: 3-8-01
SCALE: 1" = 400'
FIGURE NO:
DRAWN: MDB

Prepared by:



1306.01/0000.01

ATTACHMENT N

HAZARDOUS CONSTITUENT SAMPLING LIST
-AND-
RISK-BASED CONCENTRATION SCREENING

ATTACHMENT N

**HAZARDOUS CONSTITUENT SAMPLING LIST
AND
RISK BASED CONCENTRATION SCREENING**

1. ~~The Permittee shall analyze media for constituents listed in 40 CFR Part 261, Appendix VIII, Hazardous Constituents, and 40 CFR Part 264, Appendix IX, Groundwater Monitoring List, which have been adopted by reference in the Virginia Hazardous Waste Management Regulations (VHWMR), as codified in Title 9 of the Virginia Administrative Code, Agency 20, Chapter 60 (9 VAC 20-60). Based on site specific considerations (e.g., the contaminated media, sampling and analysis of waste from the unit, or facility specific information), the Permittee may propose to the Department for approval of a reduced list of constituents for analyses. Likewise, the above list shall not preclude the Permittee from analyzing constituents, chemical parameters or physical parameters not otherwise specified.~~
2. ~~The Permittee shall either screen analytical data against Risk Based Screening Levels (RBSLs) or, in lieu of screening, carry forward a SWMU/AOC, constituent, media and/or exposure pathway through the RFI. By use of a risk based concentration screen, the corrective action process (including any risk assessment) can be made more efficient by focusing on media, significant units, dominant contaminants and routes of exposure at the earliest feasible stage. The levels specified below represent screening levels, which are intended to guide the Permittee in recommending further action (e.g., conducting a RFI/CMS). These values are not intended to be remedial cleanup levels.~~
 - A. ~~The RBSLs will be developed from the following sources as appropriate:~~
 - i. ~~U.S. EPA Region III Technical Guidance Manual, Risk Assessment, "Selecting Exposure Routes and Contaminants of Concern by Risk Based Screening," U.S. EPA/903/r-93-001, January 1993~~
 - ii. ~~U.S. EPA Region III Risk Based Concentration (RBC) Table (most recent update)~~
 - iii. ~~Current Federal Primary Drinking Water Standards~~
 - iv. ~~Soil Screening Guidance, U.S. EPA/540/R-95/128, May 1996.~~
 - v. ~~Ambient Water Quality Criteria (AWQC).~~
 - vi. ~~Other guidance documents as appropriate and approved by the Department.~~

- B — ~~For a given medium containing a constituent with more than one risk-based concentration (i.e., one based on carcinogenic risk, one based on noncarcinogenic effects), the lower concentration shall be used. RBSLs for noncarcinogenic constituents will be based on a hazard quotient of 0.1. RBSLs for carcinogenic constituents will be based on a risk level of 1×10^{-6} .~~
- C — ~~If health-based criteria are not available for a constituent detected at the site, the Department may require that provisional RBSLs be proposed based conservatively on toxicity data reported in literature and/or health-based criteria for similar constituents. As additional toxicological data of adequate quality becomes available, the Permittee may incorporate such data into the RBSLs, subject to the Department's approval.~~
3. — ~~The Permittee may use existing data (i.e. data collected prior to the effective date of the permit) or data collected during the RFI to characterize the nature and extent of contamination for a SWMU/AOC, constituent, media and/or exposure pathway. Data collected prior to the Department's approval of a Quality Assurance Project Plan must have documentation supporting its quality. For either existing data or data collected during the RFI, the detection limits for the analytical methods used must meet the various screening criteria outlined below. Standard SW 846 method detection limits will not meet the various screening criteria outlined below for all constituents. For those constituents, the Permittee may choose to carry them forward through the RFI at one-half the detection limit, or use a more sensitive method, which can meet the screening criteria.~~
4. — ~~The requirement to implement Corrective Measures at the Facility is not contingent upon exceedances of these screening levels. That is, if the Department determines that a constituent(s) present in a concentration below screening levels may pose a threat to human health or the environment, given site-specific exposure conditions, and there is reason to believe that the constituent(s) has been released from the facility, the Department may require Corrective Measures. Likewise, the Department may deem no further action is necessary despite exceedances of these screening levels, with appropriate rationale.~~
5. — ~~The Permittee shall screen each pathway described below. A SWMU/AOC, constituent, and/or medium with sufficient quantity and quality of data, that does not exceed screening concentrations for any of the pathways may generally be eliminated from further investigation. A SWMU/AOC, constituent or medium for which analytical data exceeds screening levels for a given pathway shall require further investigation or evaluation under the RFI. Based upon all the available information (e.g. number of samples, nature of contamination, location of SWMU/AOC), the Permittee shall recommend a course of action.~~
- A. — ~~Soil screening concentrations shall be developed for each of the following exposure pathways; direct contact, inhalation, migration to groundwater, and ecological receptors.~~

- i. ~~For direct contact, RBSLs shall be developed so that contaminants remaining in soil would be safe for incidental ingestion assuming residential exposure. If the Permittee has submitted documentation supporting industrial (or other non-residential) future land use scenarios (See Condition 6 of this Attachment), the Permittee may also develop RBSLs for soils in accordance with the scenario under the Department's consideration. The Permittee may conduct the industrial screening prior to the residential screening so that, if contaminant concentrations at the unit exceed the industrial RBSLs, further investigation or evaluation is required, and the residential screening is not required. If a unit does not exceed the industrial RBSLs, then the residential screening must be conducted, so that soils at the site can be classified for direct contact exposure as follows:~~
 - a. ~~Below Residential—A SWMU/AOC or constituent for which analytical data is below residential RBSLs can generally be eliminated from further investigation for the direct contact pathway.~~
 - b. ~~Above Industrial—A SWMU/AOC or constituent for which analytical data is above industrial RBSLs shall be carried forward for additional investigation or evaluation under the RFI or CMS.~~
 - c. ~~Between Residential and Industrial—For a SWMU/AOC or constituent for which analytical data is below industrial and above residential RBSLs, the Permittee shall recommend whether further investigation or evaluation is warranted under the RFI or CMS for the direct contact pathway, based upon all available information (e.g., data quality, number of samples, nature of contamination, location of the SWMU/AOC, location and nature of actual/potential pathways and receptors, and potential for exposure).~~
- ii. ~~For inhalation, RBSLs shall be developed so that contaminants remaining in soil would be safe for inhalation of volatilized constituents or of soil-bound contaminants suspended in the air.~~
- iii. ~~For migration to groundwater, RBSLs shall be developed so that contaminants remaining in soil would not, (1) increase contamination in groundwater to concentrations that exceed RBSLs (see Condition 5 B below); and (2) increase contamination in surface water to concentrations that exceed RBSLs (see Condition 5.C. below).~~

iv. ~~For ecological receptors, if ecological exposure has occurred or is potentially occurring, the Permittee shall quantitatively screen analytical data against the appropriate ecological screening criteria below. If it is not known if ecological exposure has occurred or is potentially occurring, the Permittee must collect sufficient biotic survey data to make such a determination.~~

a. ~~Toxicological Benchmarks for Wildlife 1996 Revision Sample, B.E., D.M. Opresko, and G.W. Suter II, Oak Ridge National Laboratory, Oak Ridge, TN, 1996.~~

b. ~~Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants. 1997 Revision. Efroymsen, R.A., M.E. Will, G.W. Suter II, and A.C. Wooten, Oak Ridge National Laboratory, Oak Ridge, TN, 1997.~~

c. ~~Toxicological Benchmarks for Potential Contaminants of Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Processes. Will, M.E. and G.W. Suter II, Oak Ridge National Laboratory, Oak Ridge, TN, 1995.~~

B. ~~Groundwater screening shall be conducted both for potential human health exposure and for protection of surface water considering the nature of the groundwater/surface water interaction.~~

i. ~~For the protection of human health, groundwater samples shall be screened based on the current or potential use of the aquifer as follows:~~

a. ~~If the aquifer is a current or potential source of drinking water, or is hydraulically connected to an aquifer which could be a drinking water supply, then the Permittee shall screen groundwater against the lower of the Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act, Region III RBCs or similarly derived RBSLs.~~

b. ~~If the aquifer is not a current or potential future source of drinking water, as designated by the Department or through an EPA endorsed CSGWPP⁴, and the aquifer is not hydraulically~~

⁴ ~~In interpreting whether the aquifer is a current or potential source of drinking water, DEQ will generally use the approach outlined in the Ground Water Protection Strategy (August 1984) and/or a site specific decision making rationale included in an EPA endorsed Comprehensive State Ground Water Protection Program (CSGWPP). Currently, there are no states in Region III with an EPA endorsed CSGWPP, consequently the RCRA Program must rely on the Federal classification. It is Region III RCRA Program experience that most RCRA facilities in Region III will probably be either a current or potential drinking water supply and will not meet the requirements to be classified as a non-potable (i.e., Class III) aquifer. In Virginia, all aquifers are considered potential drinking water sources for RCRA Program objectives.~~

connected to an aquifer which could be a drinking water supply, then RBSLs appropriate for the groundwater use that could apply (e.g., agricultural) may be proposed by the Permittee and submitted for the Department's approval

- ii. For the protection of surface water, groundwater, which discharges to surface water, shall also be screened against the surface water criteria listed below in Condition 5.C

C. Surface water screening shall be conducted both for human health exposure and for protection of aquatic life. Surface water screening for human health will be based on the surface water body use, as designated by the applicable state. For drainage systems (e.g., storm water channels), the designation shall be based on the designation of the surface water body which ultimately receives the discharge. Screening for the protection of aquatic life shall also include screening of sediment.

- i. For the protection of human health, surface water samples will be screened based on the state designation as follows:

- a. If the state surface water designation includes use as drinking water, the Permittee shall use the available human health Ambient Water Quality Criteria (AWQC) for ingestion of water and organisms. Where AWQC are not available, the Permittee shall screen against the lower of MCLs, Region III RBCs or similarly derived RBSLs

- b. If the state surface water designation does not include use as drinking water, the Permittee shall use the available human health AWQC for ingestion of organisms. Where AWQC are not available, the Permittee may develop similarly derived RBSLs

- ii. For protection of aquatic life, surface water and sediment shall be screened as follows:

- a. Surface water samples shall be screened against Chronic AWQC for the protection of aquatic organisms, or, if not available, the screening values in Toxicological Benchmarks for Screening of Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation- 1996 Revision (Suter, G.W. II and C.L. Tsao, Oak Ridge National Laboratory, Oak Ridge, TN, 1996).

- b. Sediment samples shall be screened against the screening values in Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997

Revision (Jones, D.S., G.W. Suter II, and R.N. Hull, Oak Ridge National Laboratory, Oak Ridge, TN, 1997).

6. ~~If the Permittee believes that a future industrial land use scenario is applicable to the Facility, the Permittee must submit the land use information specified in the OSWER Directive No. 9355.7-04 Land Use in the CERCLA Remedy Selection Process. The Department will make a final land use determination after review of the Permittee's submittal and consultation with state and local land use planning authorities, elected officials, and the public. This determination will be independent of the screening procedures specified above.~~

~~ATTACHMENT O~~

~~RCRA FACILITY INVESTIGATION REQUIREMENTS~~

ATTACHMENT O

RCRA FACILITY INVESTIGATION REQUIREMENTS

1. ~~Phase I RCRA Facility Investigation (RFI) Plan Requirements~~

a. ~~The Phase I RFI Sampling Plan shall include:~~

- ~~(1) **Background** The Permittee shall identify current and historical site information which may affect the proposed sampling and data collection effort.~~
- ~~(2) **Maps** The Permittee shall include all pertinent locations of sampling and/or data collection on maps and shall locate all groundwater, soil, surface water, sediment, and runoff sampling points.~~
- ~~(3) **Rationale for sample locations, number and type of samples** The Permittee shall:~~
 - ~~(a) **Identify the specific sampling points for each SWMU/AOC for each potentially affected environmental media.**~~
 - ~~(b) **Provide the rationale and selection process utilized for the selection of final sampling points.**~~
 - ~~(c) **Identify the objective of the sampling plan:**~~
 - ~~(i) **A limited, biased sampling effort such that detection of hazardous waste or hazardous constituents triggers a Phase II RFI; or**~~
 - ~~(ii) **An adequate number of samples will be taken to demonstrate that no releases from the SWMU/AOC exceed a risk based number.**~~
- ~~(4) **The Permittee may elect to perform appropriate screening (geophysics, soil gas, immunoassay) prior to selecting specific sampling points:**~~
 - ~~(a) **Screening methods shall not be used as a substitute for direct sampling.**~~
 - ~~(b) **Within 90 calendar days of the effective date of this permit, the Permittee shall notify the Department and the EPA Region 3, in writing, whether or not screening methods will be performed.**~~

~~(c) — Should the Permittee elect to perform screening prior to sampling, the time to submit the Phase I RFI Plan shall be extended by sixty (60) calendar days, beyond the time specified in permit section VI.C.1.~~

~~(d) — The Phase I RFI Sampling Plan shall include the results of the screening procedures.~~

~~(5) — The unit specific groundwater sampling points identified for each SWMU/AOC may either be existing monitoring wells, new monitoring wells installed specifically for the SWMU/AOC, or a method appropriate for one time sampling of the groundwater.~~

~~— The Permittee may elect a phased groundwater investigation where Phase I is a soil gas investigation which may be used to demonstrate the need for a Phase II RFI but may not be used to rule out the Phase I RFI. Groundwater samples must be obtained from all wells on site (potable and non-potable) at the Facility in the Phase I RFI.~~

~~(6) — Soil and sediment (where feasible) sampling points must be selected where contamination is most likely to have occurred, considering topography, unit characteristics, waste mobility, runoff characteristics, and receiving stream characteristics, and all other relevant information.~~

~~— Where soil sampling is designed to assess the migration of hazardous waste and/or hazardous constituents from a SWMU or AOC structure by runoff or seepage, then the soil sampling plan and sampling points shall be established based upon the evaluation of the SWMU or AOC structure for cracks (or other failure points in a unit) or other migration pathways from the unit(s). Surface soil samples and sub-soil samples shall be conducted in the vicinity of these potential migration pathways.~~

~~— Where soil sampling is designed to assess the releases or suspected releases of hazardous waste or hazardous constituents into the air from a SWMU or AOC, then the soil sampling regime should be based upon the wind rose for the facility and air dispersion modeling and the potential air deposition from the SWMU or AOC being assessed. The soil sampling plan to assess the potential air deposition of hazardous waste and/or hazardous constituents shall include all of the supporting information utilized to establish the potential areas of deposition and the surface soil sampling points. Soil sampling shall be sufficient in areal extent and scope to provide a statistically comprehensive evaluation of the presence of hazardous waste and/or hazardous constituents due to the potential releases of hazardous waste and/or constituents to the atmosphere from the SWMUs or AOC units. Soil sampling locations shall include all areas identified as the maximum impacted receptors in the risk assessment~~

completed for the air emissions modeling for the combustion units (kilns).

~~Where surface water and sediment sampling is designed to assess the potential migration of hazardous waste or hazardous constituents by the surface water pathway, the surface water and sediment sampling plan and sampling points shall be sufficient to collect surface water and sediment from areas of the receiving drainageways, stream, ponds, wetlands, etc. Sediment samples shall be from areas of sediment deposition. Sediment samples shall also include testing and analysis and an evaluation of the sediment characteristics of each sediment sampling point and include, but not be limited to: a description of the surface water sampled, surface water flow (cfs, etc., at the time of sampling and mean cfs for stream), the sediment deposition area (nature and size), sediment thickness profile, and the physical and chemical parameters (e.g. grain size, particle distribution analyses, organic carbon content, cation exchange capacity, pH, etc.). The surface water and sediment sampling shall be sufficient in areal extent and scope to provide a statistically comprehensive evaluation of the presence of hazardous waste and/or hazardous constituents due to the potential releases of hazardous waste and/or constituents to the environment by the surface water pathway from the operations the SWMU or AOC units.~~

- ~~b. The Phase I RFI Sampling Plan shall include a Sample Collection Methods and Procedures Plan and a Quality Assurance Project Plan (Attachment R), which conforms to the analytical requirements set forth in IV.C.2. The Permittee shall also furnish to the Department the Laboratory Data Package as specified in Attachment R. The Sampling Plan shall provide for the analysis of the constituents as specified in Attachments L and N.~~
- ~~e. The Department reserves the right to require the Permittee to furnish the Department with split samples for any samples taken by the Permittee pursuant to this permit. Where split samples are taken and analyzed, the Department will provide the results to the Permittee for evaluation in the Release Assessment Report. The Permittee shall identify a procedure in the Sampling Plan for giving the Department at least two weeks notice of any planned sampling or field activities.~~
- ~~d. The Phase I RFI Sampling Plan must identify the disposition of any wastes generated as a result of the investigation. All such wastes shall be managed in accordance with applicable State, local and federal regulations, including the Land Disposal Restrictions set forth in 40 C.F.R. Part 268 and 9 VAC 20-40-268.~~
- ~~e. Concurrent with submission of a Phase I RFI Plan, the Permittee shall include a Health and Safety Plan in accordance with Attachment S, and a Sample Collection Methods and Procedures Plan, a Quality Assurance Project Plan, a Laboratory Data Package(s) and Data Management Plan as specified in Attachment R of this Permit.~~

f. ~~Schedule~~

~~In the Phase I RFI, the Permittee shall include a schedule for the implementation of the Phase I RFI and submission of the Phase I RFI Report.~~

g. ~~Community Relations Plan~~

(1) ~~The Permittee shall prepare a community relations plan for the RFI. The Permittee shall prepare a fact sheet which describes the scope and objectives of the Phase I and Phase II RFI and submit to the Department and the EPA Region 3 for comment. The community relations plan shall include a public notice and public meeting that announces and describes the forthcoming RFI to the community. The Permittee shall publish this notice in major local newspaper of general circulation. The public notice shall include the name and telephone numbers of the contact person of the Permittee and the Department. The public notice shall include the announcement of the availability of a fact sheet which describes the scope and objectives of the RFI. The fact sheet shall be mailed by the Permittee to all persons on the Facility mailing list compiled under 40 C.F.R. § 124.10(c)(1)(ix) and 9 VAC 20-60-1200.C, to the appropriate units of State and local governments, to all individuals who own or reside on the land that are contiguous to the Facility, and to individuals who own or reside on land in the other nearby areas to be investigated under the RFI. The mailing to the aforementioned individuals is to be made at least thirty (30) business days prior to start of the RFI field activities. The meeting shall be held to the extent practicable in the vicinity of the permitted facility. The public meeting shall be held no sooner than fifteen days after the date of the public notice announcement in the local paper. The Permittee shall provide sufficient copies of the fact sheet to the public at the Public Meeting and shall have a copy of the RFI Plan available for review and comment.~~

(2) ~~An executive summary shall be included with the Phase I RFI Report. Within ten (10) business days of receipt of the Department's approval of the Phase I RFI Report, the executive summary report shall be mailed to all individuals on the facility mailing list compiled under 40 C.F.R. § 124.10(c)(1)(ix) and 9 VAC 20-60-1200.C, to the appropriate units of State and local governments, to all individuals who own or reside on the land that are contiguous to the Facility, and to individuals who own or reside on land in the other nearby areas to be investigated under the RFI.~~

(3) ~~Notification of groundwater contamination~~

~~If at any time the Permittee discovers that hazardous constituents, which may have been released from a SWMU or AOC at the Facility, in~~

groundwater, or by surface water, have migrated beyond the Facility boundary in concentrations that exceed health-based levels specified in Attachment N, the Permittee shall, within fifteen (15) calendar days of such discovery:

- (a) — Provide written notice to the Department and the EPA Region 3
 - (b) — Provide notice to all individuals who own or reside on the land which overlies the contaminated groundwater.
- (4) — Notification of soil or sediment contamination. If at any time the Permittee discovers that hazardous constituents, which may have been released from a SWMU or AOC at the Facility, in air have migrated or are migrating to areas beyond the facility boundary and have resulted in soil or sediment concentrations that exceed health-based levels⁺, and that residences or other places at which continuous, long-term exposure to such constituents might occur are located within such areas, the Permittee shall, within fifteen (15) calendar days of such discovery:
- (a) — Provide written notification to the Department and the EPA Region 3
 - (b) — Provide notice to all individuals who own or reside on the land have or who may have been subject to such exposure.
- (5) — Notification of air contamination. If at any time the Permittee discovers that hazardous waste or hazardous constituents, which may have been released from a SWMU or AOC at the Facility, in air have migrated or are migrating to areas beyond the facility boundary in concentrations that exceed risk-based concentrations, and that residences or other places at which continuous, long-term exposure to such constituents might occur are located within such areas, the Permittee shall, within fifteen (15) calendar days of such discovery:
- (a) — Provide written notification to the Department
 - (b) — Provide notice to all individuals who have or may have been subject to such exposure.

⁺ - The health-based levels for such hazardous waste or hazardous constituents as derived in a manner consistent with EPA guidelines set forth in 51 Federal Register 33992, 34006, 34014, and 34028. The health-based level for carcinogens represents a concentration associated with an excess upper bound lifetime risk of 1×10^{-6} due to continuous constant lifetime exposure, and for systemic toxicants represents a concentration to which the human population, exposed to on a daily basis, is not likely to suffer an appreciable risk of deleterious effect during a lifetime. Any list prepared by EPA according to these procedures may be used. As these lists may be revised at any time based on new information, contact the VADEQ for guidance.

2. ~~Phase I RCRA Facility Investigation Report~~

a. ~~The Phase I RFI Report shall contain all data from the Phase I RFI organized in a logical sequence and shall include summaries of all findings, a description of the problems encountered during the investigation, actions taken to correct such problems, and copies of laboratory or monitoring data, etc. The Phase I RFI shall contain conclusions and recommendations regarding the need for future investigation. The recommendations shall be adequately justified. The Phase I RFI may recommend, among other things:~~

(1) ~~No further action required, if the analytical results of sampling do not indicate the presence of hazardous waste or hazardous constituents, and the present physical condition and operating conditions of the SWMU/AOC are such that there is no likelihood of a release or additional release of hazardous waste or hazardous constituents from such SWMU.~~

(2) ~~Continued monitoring, where analytical results are below the practical quantitation limits (e.g., identified in 40 C.F.R. Part 264, Appendix IX, and 9 VAC 20-60-264, Appendix IX) and the presence of hazardous waste or hazardous constituents, together with the present physical condition and operating conditions of the SWMU, indicate a threat of a release of a hazardous waste or hazardous constituents in the future.~~

(3) ~~The recommendations of the nature and scope of a Phase II RFI to characterize the rate and extent of identified releases of hazardous waste, hazardous constituents, or hazardous constituent degradation products from SWMUs, groups of SWMUs/AOCs, or other areas of contamination.~~

(4) ~~Planning and implementing interim measures at the Facility. See permit section VI B.~~

b. ~~Except as otherwise specified below in this section, the Permittee must conduct a Phase II RFI if the analytical results of sampling indicate a release of hazardous waste or hazardous constituents from a SWMU/AOC to groundwater, surface water, soil or sediment. A Phase II RFI need not be conducted for a SWMU/AOC if:~~

(1) ~~The analyses of an adequate number of samples demonstrate that concentrations of detected hazardous waste or constituents do not exceed the levels specified in Attachment N, where the Department has approved this approach in the Phase I RFI Plan, and either:~~

(a) ~~Future releases will not occur, e.g., wastes have been removed from the unit, or~~

- (b) ~~A monitoring program approved by the Director has been established, or~~
- (2) ~~The Permittee can demonstrate to the satisfaction of the Department that a specific concentration of a constituent in a medium at the Facility is naturally occurring. The demonstration for a naturally occurring constituent must show no statistically significant increase of contamination above background. The determination of background levels must be approved by the Department prior to instituting this option.~~
- e ~~If the Permittee recommends further investigation for any SWMU in the form of a Phase II RFI and believes that certain requirements identified in permit section VI.D., RCRA Facility Investigation Phase II, are not appropriate, the specific requirements shall be identified and the rationale for inappropriateness may be provided in the Phase I RFI Report. The term "requirements" as used in this paragraph refers to substantial requirements of Attachment O, e.g., the media to be investigated.~~
- d. ~~If the Permittee recommends the continued monitoring of any medium, the Permittee shall:~~

 - (1) ~~Within ninety (90) calendar days of the Department's approval of the continued monitoring recommendation, the Permittee shall submit to the Department for approval a plan for continued monitoring. A copy of the plan shall also be sent to the EPA Region 3. The plan shall include, but not be limited to, the following:~~

 - (a) ~~An expanded monitoring network of any medium, if required. If an expanded groundwater monitoring network is required, an expanded groundwater monitoring plan which includes provisions for establishing concentration limits, groundwater sampling locations, sampling and analysis procedures, data evaluation procedures, and reporting adequate to determine the presence and extent of a release from a SWMU/AOC or group of SWMUs/AOCs that are subject to continued monitoring.~~
 - (b) ~~The list of the proposed monitoring parameters for the specified medium. For groundwater monitoring the proposal shall include, in addition to the appropriate indicator parameters and hazardous constituents, the basis for selecting each proposed indicator parameter or hazardous constituent. The basis for selection shall, where possible, include the results of previous investigations, chemical analysis of the facility's wastes, emissions, and/or leachate as appropriate.~~

- ~~(c) — Proposed reporting requirements which shall be no less than annually, and~~
 - ~~(d) — A schedule for implementation of the tasks identified in the expanded monitoring plan.~~
- ~~(2) — In the event of a determination of a release to groundwater above the Department approved risk-based screening criteria during the period of continued monitoring, the Permittee shall notify the Department and the EPA Region 3. The Permittee shall either provide an explanation for the groundwater results or propose an investigation subject to Department approval.~~
 - ~~(a) — Submit a report to the Department and the EPA Region 3 within sixty (60) days of such determination which demonstrates that a source other than the SWMU caused the contamination or that the contamination resulted from error in sampling, analysis, or evaluation (40 C.F.R. §264.98(g)(6)(ii) and 9 VAC 20-60-264.98(g)(6)(ii));~~
 - ~~(b) — As directed by the Department:~~
 - ~~(i) — Sample the groundwater in all monitoring wells and determine whether constituents in the list of Appendix IX of Part 264 are present, and if so, in what concentrations, and submit a report to the Department;~~
 - ~~(ii) — Submit a Phase II RFI Plan within ninety (90) calendar days as specified in permit section VI.D 1.; or~~
 - ~~(iii) — Submit a modified groundwater monitoring for approval.~~
- ~~e. — If the Permittee recommends the continued monitoring option, for any other type of monitoring other than groundwater, the Permittee shall:~~
 - ~~(1) — Within ninety (90) calendar days of the Director's approval of the continued monitoring recommendation, the Permittee shall submit a plan for the Department's approval and provide a copy to the EPA Region 3. The plan shall include, but not be limited to, the following:~~
 - ~~(a) — Proposed monitoring activities.~~
 - ~~(b) — Criteria with which to determine if a release has occurred.~~
 - ~~(c) — Proposed reporting requirements which shall be no less than annually.~~

~~(d) — A schedule for implementation~~

~~(2) — In the event of a determination of release, the Permittee shall notify the Director within seven calendar days of such determination and either:~~

~~(a) — Submit reports to the Department and EPA Region 3 within sixty (60) days of such determination, which demonstrates that a source other than the SWMU caused the contamination or that the contamination resulted from error in sampling, analysis, or evaluation, or~~

~~(b) — Submit a Phase II RFI Plan within 90 calendar days to the Department and the EPA Region 3 as specified in permit section VI.D.1.~~

~~3. — Phase II RCRA Facility Investigation (RFI) Plan requirements~~

~~a. — General Description of Current Conditions Section~~

~~The Permittee shall provide background information pertinent to the facility, contamination, and interim measures as set forth below. The data gathered during any previous investigations or inspections and other relevant data that shall be included.~~

~~(1) — Facility Background~~

~~The Permittee shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage, or disposal of solid and hazardous waste. The Permittee shall include in this section the following:~~

~~Map(s) depicting the following:~~

~~(a) — General geographic location:~~

~~(i) — Property lines, with the owners of all adjacent property clearly indicated.~~

~~(ii) — The location of all known past solid or hazardous waste treatment, storage, or disposal areas and the site of all known spills, fires or other accidental or intentional release locations, including the approximate locations of any groundwater contamination plumes presently identified.~~

~~(iii) — All known past and presently operating product and~~

~~hazardous or solid waste underground tanks or piping.~~

- ~~(iv) — The location of all production and groundwater monitoring wells, whether or not they are associated with the particular SWMU under investigation. These wells shall be clearly labeled. Ground, top of casing and screened interval elevations shall also be provided, if available.~~
- ~~(v) — Topography (with a contour interval of 10 feet and a scale of 1 inch = 100 feet), waterways, all wetlands, floodplains, water features, drainage patterns.~~
- ~~(vi) — All tanks, buildings, utilities, paved areas, easements, right-of-way, and other features.~~
- ~~(vii) — Surrounding land uses (residential, commercial, agricultural, and recreational).~~

~~All maps shall be consistent with the requirements set forth in 40 CFR § 270.14(b)(19) and be of sufficient detail and accuracy to locate and report all current and future work performed at the site.~~

- ~~(b) — A history and description of ownership and operation, solid and hazardous waste generation, and treatment, storage, and disposal activities at the facility.~~
- ~~(c) — Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location of the spills, and a description of the response actions conducted (local, State, or Federal response units or private parties), including any inspection reports or technical reports generated as a result of the response.~~
- ~~(d) — A summary of past permits requested and/or received any enforcement actions and their subsequent responses.~~

(2) — Nature and Extent of Contamination

— The Permittee shall submit information in this section, describing the existing nature and extent of contamination.

- ~~(a) — The Permittee shall summarize all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spill areas, and other suspected source areas of contamination. For each area, the Respondent shall identify the following.~~

- ~~(i) Location of unit/area (which shall be depicted on a facility map).~~
- ~~(ii) Quantities of solid and hazardous wastes.~~
- ~~(iii) Hazardous waste or hazardous constituents, to the extent known.~~
- ~~(iv) Identification of areas where additional information is necessary.~~
- ~~(b) The Permittee shall prepare an assessment and description of the existing degree and extent of contamination. This should include:~~
 - ~~(i) Available monitoring data and qualitative information on locations and levels of contamination at the facility.~~
 - ~~(ii) All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality.~~
 - ~~(iii) The potential impact(s) on human health and the environment, including demography, ground water and surface water use, and land use.~~
- ~~(3) Implementation of Interim Measures~~

~~The Permittee shall provide information documenting interim measures, which were or are being undertaken at the facility. This shall include:~~

- ~~(a) Objectives of the interim measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term solution at the facility.~~
- ~~(b) Design, construction, operation, and maintenance requirements.~~
- ~~(c) Schedules for design, construction, and monitoring.~~
- ~~(d) Schedule for progress reports.~~

~~b. Potential Corrective Measure Technologies Section~~

~~Based on existing information, the Permittee shall identify:~~

- (1) ~~The potential corrective measure technologies that may be used at the Facility or beyond the boundaries of the Facility to respond to releases of hazardous waste or hazardous constituents at or from the Facility.~~
- (2) ~~Any field, laboratory, bench scale or pilot scale data that needs to be collected in the RFI to facilitate the evaluation and selection of the final corrective measure(s), if any, for releases at or from the Facility (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.)~~

e. ~~Project Management Plan Section~~

~~The Permittee shall submit a Project Management Plan to the Department and the EPA Region 3, which shall include a discussion of the technical strategy, schedules, budget, and personnel that will be used for the study. The plan shall also include a description of the qualifications of personnel performing or directing the RFI, including contractor personnel, and document the overall management approach to the RFI.~~

d. ~~Community Relations Plan Section~~

- (1) ~~The Permittee shall continue the Community Relations Plan established under the approved Phase I RFI Plan. The Permittee shall prepare a fact sheet describing the scope and objectives of the Phase II RFI and submit to the Department and the EPA Region 3 for comment. The Permittee shall mail this fact sheet to all persons on the Facility mailing list compiled under 40 CFR § 124.10(c)(1)(ix), to the appropriate units of State and local governments, to all individuals who own or reside on the land that are contiguous to the Facility, and to individuals who own or reside on land in the other nearby areas to be investigated under the RFI at least ten (10) business days prior to start of the field activities.~~
- (2) ~~All public notification requirements specified in the Community Relations Plan under the approved Phase I RFI Plan which pertain to off-site groundwater contamination, soil or sediment contamination, or air contamination shall be maintained throughout the Phase II RFI, the Corrective Measures Study (CMS), and the Corrective Measures Implementation (CMI) phases, if applicable.~~
- (3) ~~An executive summary of the RCRA Facility Investigation (RFI) Report shall be included with the RFI Report (permit section VI.D.5). Within ten (10) business days of receipt of the Department's approval of the RFI Report, the executive summary report shall be mailed to all individuals on the facility mailing list compiled under 40 CFR § 124.10(c)(1)(ix), to the appropriate units of State and local governments, and to all individuals who own or reside on the land that are contiguous to the Facility, and to~~

individuals who own or reside on land in the other nearby areas investigated under the RFI.

e — Schedule

~~The Permittee shall provide a schedule for performance of the Phase II RFI tasks and the submission of a Phase II RFI Report, within the RFI Plan.~~

4. — Phase II RCRA Facility Investigations

a — Environmental Setting Investigation

~~The Permittee shall collect information to supplement and verify existing information on the environmental setting at the Facility. The Permittee shall characterize the following:~~

(1) — Geology and Hydrogeology

~~The Permittee shall conduct a program to evaluate the hydrogeologic conditions at the Facility. The program shall provide:~~

(a) — A description of the regional and site specific geologic units underlying the Facility, including:

(i) — Stratigraphy, strike and dip, and identification of stratigraphic contacts.

(ii) — Structural features: folding, fracturing, channeling, faulting, jointing.

(iii) — Soil: classification, description of appearance, and consistency.

(b) — A description of regional and site specific hydrogeologic characteristics, including:

(i) — Regional and Facility specific groundwater flow patterns.

(ii) — A characterization of seasonal variations in the groundwater flow regime, including any perched groundwater zones.

(iii) — Identification and characterization of areas of recharge and discharge.

(iv) — An analysis of any topographic or geomorphic features that

- ~~might influence the groundwater flow system~~
- ~~(v) — A description of the stratigraphic units including:~~
 - ~~(a) — Hydraulic conductivity.~~
 - ~~(b) — An interpretation of hydraulic interconnections between saturated zones, including any perched zones.~~
 - ~~(c) — Attenuation capacity and mechanisms of the soils (e.g., ion exchange capacity, organic carbon content, mineral content, redox potential, etc.).~~
- ~~(e) — Using a topographic map as a base, and at least two, approximately perpendicular geologic cross sections for each SWMU/AOC and the surrounding area, provide a description of the extent (depth, thickness, lateral extent) of each geologic unit including:~~
 - ~~(i) — Generalized soil (based on testing, grain size, water content, Atterburg limits, etc.) and rock profiles.~~
 - ~~(ii) — Encountered features such as faults, fractures, voids, stratum changes, lenses, pinch out zones, karst features, etc.~~
 - ~~(iii) — Location and type of sampling including blow counts, percent recovery, etc.~~
 - ~~(iv) — Location and type of in situ testing performed (pressuremeter, packer permeability testing, slug tests, pump tests, etc.).~~
 - ~~(v) — Groundwater elevation and/or potentiometric elevation.~~
- ~~(d) — A description of the Facility site flow system including:~~
 - ~~(i) — Water level contour and/or potentiometric maps.~~
 - ~~(ii) — The vertical and horizontal components of flow.~~
 - ~~(iii) — Any temporal changes in water levels or hydraulic gradients, for example, due to tidal or seasonal influences.~~
 - ~~(iv) — Active and inactive local water supply and production wells with an approximate schedule of pumping.~~

- (v) — ~~Man-made hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention ponds, etc.).~~

(2) — Soils

~~The Permittee shall conduct a program to evaluate the soil conditions at the Facility. The program shall provide the following information:~~

- (a) — ~~Where remediation by removal of soils is the only corrective measures option, provide map(s) and perpendicular cross sections showing:~~

- (i) — ~~The extent of contamination.~~

- (ii) — ~~Depth to groundwater.~~

- (iii) — ~~The consistency and distribution of soils using the Unified Soil Classification System (USCS) (ASTM D 2487).~~

- (b) — ~~Where remediation by removal is the likely option but it is necessary to determine the extent of migration (for example, to assess the mobility of wastes from an unlined surface impoundment or landfill) provide the following in addition to the requirements immediately above:~~

- (i) — ~~Depth to bedrock and the characteristics of the bedrock including lithologic variations, discontinuities such as faults, fissures, joints, fractures, sinkholes, karst features, etc.~~

- (ii) — ~~A detailed soil survey conducted according to USDA Soil Conservation Service (SCS) procedures including:~~

- (a) — ~~USDA Textural Soil Classification and soil profiles showing stratifications or zones, which may affect or direct the subsurface flow.~~

- (b) — ~~Hydraulic conductivity and the SCS hydrologic group classification, A, B, C or D.~~

- (c) — ~~Relative permeability (only if the waste may have changed the soil's hydraulic conductivity, such as concentrated organics).~~

- (d) — ~~Storage capacity.~~

~~(e) Shrink-swell potential (where extreme dry weather could lead to the formation of cracks).~~

~~(f) Potential for contaminant transport via erosion, using the Universal Soil Loss Equation.~~

~~(g) Soil sorptive capacity.~~

~~(h) Cation exchange capacity.~~

~~(i) Soil organic content.~~

~~(j) Soil pH.~~

~~(iii) The following contaminant characteristics must be included (where properties have been estimated, include the basis for such estimations):~~

~~(a) Physical state.~~

~~(b) Viscosity.~~

~~(c) pH.~~

~~(d) pKa.~~

~~(e) Density.~~

~~(f) Water solubility.~~

~~(g) Henry's Law Constant.~~

~~(h) Kow.~~

~~(i) Biodegradability.~~

~~(j) Rates of hydrolysis, photolysis and oxidation.~~

~~(e) When in situ soil treatment will likely be the remediation, the following additional information must be provided:~~

~~(i) Bulk density.~~

~~(ii) Porosity.~~

~~(iii) Grain size distribution.~~

- ~~_____ (iv) Mineral content.~~
- ~~_____ (v) Soil moisture profile.~~
- ~~_____ (vi) Unsaturated hydraulic conductivity.~~
- ~~_____ (vii) Effect of stratification on unsaturated flow.~~
- ~~_____ (viii) Infiltration and evapotranspiration.~~

~~(3) Surface Water and Sediment~~

~~The Permittee shall conduct a program to characterize the surface water bodies in the vicinity of the Facility. Such characterization shall include, but not be limited to:~~

- ~~(a) Description of the temporal and permanent surface water bodies including:~~
 - ~~(i) For lakes: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume~~
 - ~~(ii) For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment.~~
 - ~~(iii) For streams, ditches, and channels: location, elevation, flow, velocity, depth, width, tidal and seasonal fluctuations, and flooding tendencies (i.e., 100 year event).~~
 - ~~_____ (iv) Drainage patterns.~~
 - ~~_____ (v) Evaporation rate~~
- ~~(b) Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biochemical oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients (ammonia, nitrate/nitrite nitrogen, phosphate), chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.~~
- ~~_____ (c) Description of sediment characteristics including:~~
 - ~~_____ (i) Deposition area~~

~~(ii) Thickness profile.~~

~~(iv) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.)~~

~~(4) Air~~

~~If the Department requires an RFI for air releases from a SWMU/AOC, the Permittee shall provide information characterizing the climate in the vicinity of the Facility. Such information shall include, but not be limited to:~~

~~(a) A description of the following parameters: Annual and monthly rainfall averages; monthly temperature averages and extremes; wind speed and direction; relative humidity/dew point; atmospheric pressure, evaporation data; development of inversions, and climate extremes that have been known to occur in the vicinity of the Facility, including frequency of occurrence~~

~~(b) A description of topographic and manmade features which affect air flow and emission patterns, including ridges, hills, or mountain areas; canyons or valleys; surface water bodies (e.g., rivers, lakes, bays, etc.); wind breaks and forests; and buildings.~~

~~b. Source Characterization Investigation~~

~~The Permittee shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, including type, quantity, physical form, disposition (containment or nature of deposits), and Facility characteristics affecting release (e.g., Facility security, and engineered barriers). This shall include quantification of the following specific characteristics at each source area:~~

~~(1) Unit/Disposal Area Characteristics:~~

~~(a) Location of unit/disposal area.~~

~~(b) Type of unit/disposal area.~~

~~(c) Design features.~~

~~(d) Operating practices (past and present).~~

~~(e) Period of operation.~~

~~(f) Age of unit/disposal area.~~

~~(g) General physical conditions.~~

~~(h) Method used to close the unit/disposal area.~~

~~(2) Waste Characteristics:~~

~~(a) Type of waste placed in the unit, including but not limited to: Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing, or reducing agent); quantity; and chemical composition.~~

~~(b) Physical and chemical characteristics, including but not limited to: Physical form (solid, liquid, gas); physical description (e.g., powder, oily sludge); temperature; pH; general chemical class (e.g., acid, base, solvent); molecular weight; density; boiling point; viscosity; solubility in water; cohesiveness of the waste; and vapor pressure.~~

~~(c) Migration and dispersal characteristics of the waste, including but not limited to biodegradability, bioconcentration, biotransformation; photodegradation rates; hydrolysis rates; sorption; and chemical transformations.~~

~~The Permittee shall document the procedures used in making the above characterizations.~~

~~e Contamination Characterization Investigation~~

~~The Permittee shall collect analytical data on groundwater, soils, surface water, sediment, and subsurface gas contamination in the vicinity of the Facility. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found conditions during sampling, and the identity of the individuals performing the sampling and analysis. The data must include the analyses of hazardous constituents as specified in Attachment N, at a minimum, unless otherwise approved by the Department prior to sampling. The Permittee shall address the following types of contamination at the Facility:~~

~~(1) Groundwater Contamination~~

~~The Permittee shall conduct a groundwater investigation to characterize any plumes of contamination at the Facility. This investigation shall provide, at a minimum, the following information:~~

~~(a) A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility.~~

~~(b) The horizontal and vertical direction of contamination movement.~~

~~(c) The velocity of contaminant movement.~~

~~(d) The horizontal and vertical concentration profiles of hazardous constituents in the plume(s).~~

~~(e) An evaluation of factors influencing the plume movement.~~

~~(f) An extrapolation of future contaminant movement.~~

~~(g) Each RFI Plan shall include the locations, design and installation procedures for any additional groundwater monitoring wells required to complete the monitoring well network at each area as necessary to meet the RFI objectives. These wells may be used in conjunction with existing wells in the area. All information required of the new wells shall also be required of the existing wells. The monitoring well network shall meet the following requirements:~~

~~(i) The upgradient wells must be capable of yielding samples that are representative of background water quality in the uppermost aquifer and are not affected by any solid waste management unit. The number and location of the wells must be sufficient to characterize the spatial variability of background water.~~

~~(ii) The downgradient wells must be capable of immediately detecting any statistically significant amounts of hazardous waste or hazardous constituents that migrate from each solid waste management unit into the groundwater.~~

~~(iii) The monitoring system shall be designed to operate for a period of long-term duration.~~

~~When developing this information, the Permittee shall refer to the "Handbook of Suggested Practices for the Design and Installation of Ground Water Monitoring Wells," EPA/600/4-89/034, 1989 to determine methods and materials that are acceptable to the Department.~~

~~(h) Each RFI Plan shall provide a description of the groundwater monitoring wells including the following information.~~

~~(i) A description and map of well locations, including a survey of each well's surface reference point and the elevation of~~

the top of its casing.

-
- ~~(ii) Size and depth of each well.~~
 - ~~(iii) Description of well intake design, including screen slot size and length, filter pack materials and method of filter pack placement.~~
 - ~~(iv) Type of well casing and screen materials. The choice of well materials shall consider the parameters to be monitored and the nature of the leachate that could potentially migrate from the facility. The well materials shall: (1) minimize the potential of absorption of constituents from the samples; and (2) maintain their integrity for the life of the system.~~
 - ~~(v) Description of methods used to seal the well from the surface and prevent downward migration of contaminants through the well annulus.~~
 - ~~(v) Description of the methods and procedures used to develop the well.~~
 - ~~(i) The Permittee shall select a sampling regime and conduct sampling and analysis activities capable of yielding representative samples. The sampling program shall include, at a minimum, the following elements:
 - ~~(i) The list of analytes as specified in Attachments L and N of this Permit (or as modified with prior approval by the Department).~~
 - ~~(ii) If the groundwater investigation is phased (i.e., conducted based on the results of a soil investigation), a list of parameters capable of detecting releases of hazardous waste or hazardous constituents into groundwater. The parameters shall be representative of hazardous constituents at least as mobile as the most mobile hazardous constituent that may be present after considering:
 - ~~(a) The types, quantities, and concentrations of hazardous constituents in wastes managed at the SWMU/AOC. Incidental constituents which may be released into the unit area from process areas shall be included in this list of analyses.~~~~~~
-

- (b) ~~The mobility, stability, and persistence of hazardous waste constituents or their reaction products in the unsaturated zone beneath the waste management area.~~
 - (c) ~~The detection ability of the indicator parameters, waste constituents of reactive products in groundwater.~~
 - (d) ~~The concentration of and the natural variation (known or suspected) of the proposed monitoring parameters in background media.~~
 - (e) ~~The list must include the basis for selecting each proposed indicator parameter, including any analysis or calculations performed. The basis for selection shall, where possible, include chemical analysis of the unit's waste and/or leachate as appropriate. The list shall also include parameters to characterize the site-specific chemistry of groundwater at the site including, but not limited to, the major anions and cations that make up the bulk of dissolved solids in water (i.e., Cl^- , Fe^{3+} , Mn^{2+} , Na^+ , $(\text{SO}_4)^{2-}$, Ca^{2+} , Mg^{2+} , K^+ , NO_3^- , PO_4^{3-} , silicate, and ammonium).~~
 - (j) ~~The Permittee shall document in the Phase II RFI Report the procedures used to characterize contaminant plume(s), for example, geophysics, modeling, pump tests, slug tests, nested piezometers, etc.~~
- (2) ~~Soil Contamination~~

~~The Permittee shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release. The soil contamination investigation shall include:~~

- (a) ~~A description of the vertical and horizontal extent of contamination.~~
- (b) ~~A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, cation exchange capacity, biodegradability, hydrolysis, photolysis, oxidation, and other factors that might affect contaminant migration and~~

~~transformation.~~

- ~~(c) — Specific contaminant concentrations according to the analyte list (or as modified with prior approval by the Department).~~
- ~~(d) — The velocity and direction of contaminant movement.~~
- ~~(e) — An extrapolation of future projected contaminant movement.~~

~~The Permittee shall document in the Phase II RFI Report the procedures used in making the above characterizations and determinations of future contaminant movement.~~

~~(3) — Surface Water and Sediment Contamination~~

~~The Permittee shall conduct a surface water investigation to characterize contamination in surface water bodies resulting from contaminant releases at the Facility.~~

~~The investigation shall generate, at a minimum, the following information:~~

- ~~(a) — A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility, and the extent of contamination in underlying sediments.~~
- ~~(b) — The horizontal and vertical direction of contaminant movement.~~
- ~~(c) — The contaminant velocity.~~
- ~~(d) — An evaluation of the physical, biological, and chemical factors influencing contaminant movement.~~
- ~~(e) — An extrapolation of future projected contaminant movement.~~
- ~~(f) — A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.~~

~~The Permittee shall document in the Phase II RFI Report the procedures used in making the above characterizations.~~

~~(4) — Subsurface Gas Contamination~~

~~The Permittee shall conduct an investigation to characterize subsurface gases emitted from buried hazardous waste or hazardous constituents. This investigation shall generate, at a minimum the following information:~~

- (a) ~~— A description of the horizontal and vertical extent of subsurface gases migration.~~
- (b) ~~— The chemical composition of the gases being emitted.~~
- (c) ~~— The rate, amount, and density of the gases being emitted.~~
- (d) ~~— Horizontal and vertical concentration profiles of the subsurface gases emitted.~~

~~The Permittee shall document in the Phase II RFI Report the procedures used in making the above characterizations.~~

(5) ~~— Air Contamination~~

~~The Permittee shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere. This investigation shall generate, at a minimum, the following information:~~

- (a) ~~— A description of the horizontal and vertical dispersion of contaminants (vapors and particulates).~~
- (c) ~~— The rate, chemical and physical concentrations, and loadings of the contaminants(s) released in both vapors and particulates.~~
- (b) ~~— The rate, chemical and physical concentrations, and loadings of contaminants in the vapor and particulate phases at the points of exposure. This includes the development of contaminant concentration profiles for the gaseous and particulate phases and includes development of deposition profiles of contaminants.~~

~~The Permittee shall document in the Phase II RFI Report the procedures, models and methods used in making the above characterizations. All assumptions and factors used in the models and methods shall be documented.~~

d ~~— Potential Receptors Investigation~~

~~The Permittee shall collect data describing the human populations and environmental systems that may be exposed to releases of hazardous waste or hazardous constituents from the Facility. Chemical analysis of biological samples may be required. Data on observable effects in ecosystems may also be required. The following characteristics shall be identified:~~

- (1) ~~— Local uses and possible future uses of groundwater:~~

- ~~(a) Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial).~~
- ~~(b) Location of groundwater users, including wells and discharge areas.~~
- ~~(2) Local uses and possible future uses of surface waters draining the Facility:~~
 - ~~(a) Domestic and municipal (e.g., potable and lawn/garden watering).~~
 - ~~(b) Recreational (e.g., swimming, fishing).~~
 - ~~(c) Agricultural.~~
 - ~~(d) Industrial.~~
 - ~~(e) Environmental (e.g., fish and wildlife propagation).~~
- ~~(3) Human use of or access to the Facility and adjacent lands, including, but not limited to:~~
 - ~~(a) Recreation.~~
 - ~~(b) Hunting.~~
 - ~~(c) Residential.~~
 - ~~(d) Commercial.~~
 - ~~(e) Zoning.~~
 - ~~(f) Relationship between population locations and prevailing wind direction.~~
- ~~(4) A demographic profile of the people who use or have access to the Facility and adjacent land, including, but not limited to: age, sex, and sensitive subgroups.~~
- ~~(5) A description of the biota in surface water bodies or wetlands on, adjacent to, or affected by the Facility. An evaluation of the pollutant impacts on the ecosystems/populations potentially exposed to contamination. This evaluation may be accomplished through the use of toxicity test (acute and chronic) population surveys and literature reviews.~~
- ~~(6) A description of the ecology overlying and adjacent to the Facility must~~

include:

- (a) — The location and size of each identified habitat e.g. stream reaches, roads, wetlands or forested area, within the physical boundaries defined for the assessment
- (b) — A listing and physical assessment of the ecosystems and population potentially exposed to contamination.
- (c) — A description of any endangered or threatened species near the Facility.

e. — Laboratory and Bench Scale Studies

If specifically required by the Department at any time during the Phase II RFI, the Permittee shall conduct laboratory and/or bench scale studies to determine the applicability of corrective measure technology or technologies to facility conditions. The Permittee shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

The Permittee shall develop a testing plan identifying the type(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation.

Upon completion of the testing, the Permittee shall evaluate the testing results to assess the technology or technologies with respect to the site specific questions identified in the test plan. The Permittee shall prepare a report summarizing the testing program and its results, both positive and negative.

f. — Risk Assessment

The baseline risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases (under the assumption of no action).

The baseline risk assessment contributes to the site characterization and subsequent development, evaluation, and selection of appropriate response alternatives. There are four steps in the risk assessment process.

- (1) — Determine contaminants of concern: Data collection and evaluation involves the gathering and analyzing the site data relevant to the human health evaluation and identifying the substances present at the site that are the focus of the risk assessment process.
- (2) — Exposure assessment: Using the procedure outline in Section d for

determining potential receptors, estimate the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed. In the exposure assessment, reasonable maximum estimates of exposure are developed for both current and future land use assumptions.

(3) ~~Toxicity assessment: This component of the risk assessment considers the types of adverse health effects associated with chemical exposures and the relationship between the magnitude of exposure and adverse effects.~~

(4) ~~Risk Characterization. This summarizes and combines outputs of the exposure and toxicity assessments to characterize baseline risk, both in quantitative expressions and qualitative statements.~~

5. ~~Phase II RCRA Facility Investigation Report~~

~~The Phase II RFI Report shall be submitted for the Department's approval. A copy of the Phase II RFI Report shall be submitted to the EPA Region 3. The Phase II RFI Report shall include an analysis and summary of all Facility investigations and the results of such investigations.~~

~~a. Data Analysis~~

~~The Permittee shall analyze all Facility investigation data outlined in permit section VI C, RCRA Facility Investigation, and prepare a report on the type and extent of contamination at the Facility, including sources and migration pathways. The report shall describe the extent of contamination (qualitative and quantitative) in relation to screening levels specified in Attachment N and background levels indicative of the area.~~

~~b. Media Cleanup Standards~~

~~The Permittee shall identify the following cleanup standards.~~

~~(1) Groundwater Cleanup Standards~~

~~The Permittee shall provide information to support selection/development of Groundwater Cleanup Standards for all of the hazardous constituents found in the groundwater during the RCRA Facility Investigation.~~

~~(a) The Groundwater Cleanup Standards shall consist of:~~

~~(i) The Maximum Contaminant Level (MCL) for any constituents with an EPA promulgated Maximum Contaminant Level (MCL), if the background level of the constituent is below the value of the EPA approved MCL.~~

~~(ii) The background level of that constituent in the groundwater.~~

~~(iii) A standard established according to the criteria for Other Media Cleanup Standards.~~

~~(2) Other Media Cleanup Standards~~

~~The Permittee shall identify concentration levels in the affected media, which protect human health and the environment.~~

~~Unless a lower concentration level is deemed necessary to protect environmental receptors, cleanup standards shall be established as follows:~~

~~(a) For any known or suspected carcinogens classified by EPA's weight of evidence classification as an A, B1 or B2 carcinogen, cleanup standards shall be established at concentration levels such that the cumulative (total) excess upper bound lifetime risk from chemicals falls within the risk range of 1×10^{-4} to 1×10^{-6} .~~

~~(b) For systemic toxicants, cleanup standards shall represent concentration levels to which the human population (including sensitive subgroups) could be exposed on a daily basis without appreciable risk of deleterious effect during a lifetime.~~

~~(c) The Permittee shall recommend which SWMUs, or groups of SWMUs/AOCs, require a Corrective Measures Study. The Permittee shall also identify those corrective action alternative(s) the Permittee intends to investigate further. The Permittee may either investigate several alternatives or focus on a limited number of alternative.~~

ATTACHMENT P

CORRECTIVE MEASURES STUDY REQUIREMENTS

ATTACHMENT P

CORRECTIVE MEASURES STUDY REQUIREMENTS

The purpose of a Corrective Measures Study (CMS) is to develop and evaluate remedial alternative(s) and to recommend the remedy(ies) to be taken (refer to Permit Section VI.E.). The Permittee may elect either to screen a number of potential remedies prior to evaluating a smaller number of potential remedies or delete the screening step and proceed with evaluation of the expected remedy(ies), including any specified by the Department.

The Corrective Measures Study shall consist of:

1. ~~Screening of Potential Remedies:~~

~~Should the Permittee elect to screen a number of potential remedies, any potential remedy specified in the Department's approval of the RFI Report shall also be screened. The Permittee shall document the reasons for eliminating any technology~~

a. ~~The characteristics which shall be used to screen inapplicable remedies or technologies include, but are not limited to:~~

(1) ~~Site and Media Characteristics:~~

~~Site and media data shall be reviewed to identify conditions that may limit or promote the use of certain technologies. The use of technologies, which are clearly precluded by site or media characteristics, shall be eliminated from further consideration~~

(2) ~~Waste Characteristics:~~

~~Potential remedies clearly limited by the waste characteristics should be eliminated from consideration~~

(3) ~~Technology Limitations:~~

~~During the screening process, the level of technological development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process.~~

b. ~~The Permittee shall select remedy(ies) based on the above screening, together with any remedy(ies) specified by the Department, for further evaluation. Should potential remedy(ies) specified by the Department prove infeasible based on the above screening, the Permittee may request that the alternative(s) be~~

~~dropped from further investigation. However, until approved, the request shall not stay the conditions of this Permit.~~

2. ~~Evaluation of Potential Remedies~~

~~The Permittee shall evaluate the selected potential remedy(ies), including any specified by the Department~~

~~The evaluation shall include a description of each potential remedy, which shall include, but is not limited to preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. Each potential remedy shall be evaluated with respect to the following criteria:~~

a ~~Evaluations of alternative final remedial measures shall address the following considerations in the order that is presented below~~

(1) ~~Control of the sources of releases so to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment.~~

(2) ~~Overall protection of human health and the environment~~

(3) ~~Compliance with standards and criteria for all media (i.e., for soils, subsoils, groundwater, sediment, surface water, and air) based upon State and Federal regulations, requirements, and guidance.~~

~~Compliance with State and Federal standards and criteria may be established by risk-based assessment of human health and the environment and the establishment of risk-based action levels. The risk-based action levels are to be established by a comprehensive risk assessment of the contaminants released and detected, in conjunction with modeling of fate and transport of the HCOCs at the site. A detailed evaluation and summary of findings associated with the toxicity, mobility, and volume of HCOCs needs to be provided.~~

~~Compliance with State standards for the restoration of state waters to such quality which allows for their most "Beneficial Use" shall be addressed in the evaluations of alternative final remedial measures. Restoration of groundwater to the most "Beneficial Use" shall be considered restoration of groundwater to conditions suitable for public water supply use for human consumption in accordance with State standards.~~

(4) ~~The long term effectiveness and permanence of the remedial measure. This includes an evaluation of the persistence, toxicity, and mobility of the hazardous substances and constituents, and their propensity to bioaccumulate~~

- ~~(5) — Short term effectiveness and potential for human exposure.~~
- ~~(6) — Feasibility of using the technology.~~
- ~~(7) — Capital costs and the operation and maintenance costs using the technology. The evaluation also needs to consider the potential for future remedial action costs (based upon present worth costs) if the alternative remedial corrective action in question were to fail.~~
- ~~(8) — State, EPA, and community acceptance.~~

~~The CMS shall evaluate the feasibility of reaching the action levels determined in accordance with Attachment O and to estimate the time frames of remediation based upon both a hydrogeochemical and engineering analyses. Various alternatives to address the contamination problems shall be presented and evaluated in the CMS. The proposed alternatives and evaluations in the CMS should be based upon similar case histories of contaminated sites, and/or findings by academia, research, etc.~~

~~b — Technical~~

- ~~(1) — Assessment of the effectiveness of potential remedies in achieving adequate control of source and cleanup of the hazardous waste (including hazardous constituents) released from solid waste management units.~~
- ~~(2) — Evaluation of the performance, reliability, ease of implementation, and potential impacts of the remedy, including safety impacts, cross media impacts, and control of exposure to any residual contamination.~~
- ~~(3) — Assessment of the time required to begin and complete the remedy.~~
- ~~(4) — Estimation of the costs of remedy implementation.~~
- ~~(5) — Assessment of institutional requirements, such as state or local permits requirements, or other environmental or public health requirements which may substantially affect implementation of the remedy(ies).~~

~~c — Human health: The potential remedy(ies) shall be evaluated with respect to mitigation of short and long term potential exposure to any residual contamination and protection of human health, both during and after implementation.~~

~~d. — Environmental: An evaluation of the facility conditions and pathways of contamination actually addressed by each potential remedy. The evaluation shall include the short term and long term beneficial and adverse effects, any adverse effects on environmentally sensitive areas, and an analysis of measures to mitigate~~

such adverse effects.

- e. ~~Institutional. The Permittee shall evaluate the effects of federal, State, and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations, including the requirements for construction and operating permits on the design, operation, and timing of the remedy(ies)~~

3. ~~Cost Estimate~~

~~The Permittee shall develop a cost estimate for the remedy(ies) and for each phase or segment of the remedy(ies) including:~~

- a. ~~Capital costs consisting of direct (construction) and indirect (non construction and overhead) costs.~~
- b. ~~Post construction costs, including operation and maintenance) necessary to ensure continued effectiveness of the alternative(s).~~

4. ~~Interim Reporting~~

~~The Permittee shall submit bi-monthly or alternate progress reports containing:~~

- a. ~~A description and estimate of the percentage of the CMS completed.~~
- b. ~~Summaries of all findings.~~
- c. ~~Summaries of all contacts with representatives of the local community, public interest groups, or State government during the reporting period.~~
- d. ~~Summaries of all problems or potential problems encountered during the reporting period.~~
- e. ~~Actions being taken to rectify problems.~~
- f. ~~Changes in personnel during the reporting period.~~
- g. ~~Projected work for the next reporting period.~~

5. ~~Final Report~~

~~According to the approved schedule, the Permittee shall submit to the Department for approval a Corrective Measures Study Report. A copy of the CMS Report shall be submitted to the EPA Region 3. The report shall include:~~

- a. ~~An updated description of conditions at the Facility and the nature and extent of the contamination as documented by the RCRA Facility Investigation Report.~~

- ~~_____ The Permittee shall update the information with respect to any response activities or interim measures which have been implemented or are being implemented at the Facility.~~
- b. ~~_____ Recommended objectives for corrective action for each SWMU, AOC, or group of SWMUs/AOCs. These objectives shall be based on public health and environmental criteria, information gathered during the RCRA Facility Investigation, EPA guidance, and the requirements of any applicable state and federal statutes or regulations.~~
- c. ~~_____ The Permittee shall justify and recommend a remedy(ies) using technical, human health, and environmental standards and criteria. These recommendations shall include summary tables, which allow the alternative(s) to be understood easily. Trade-offs among health risks, environmental effects, and other pertinent factors among the alternatives evaluated shall be highlighted. Information on all evaluated potential remedy(ies) shall be presented.~~
- d. ~~_____ The Report shall, at a minimum, include:~~
 - (1) ~~_____ A description of the facility, site topographic map(s) and preliminary layouts.~~
 - (2) ~~_____ For the selected remedy(ies) include:~~
 - (a) ~~_____ Performance expectations, i.e., the selected remedy is expected to achieve the Media Cleanup Standards in the approved RCRA Facility Investigation Report.~~
 - (b) ~~_____ Preliminary design criteria and rationale.~~
 - (c) ~~_____ General operation and maintenance requirements.~~
 - (d) ~~_____ Long term monitoring requirements.~~
 - (e) ~~_____ Design and Implementation Precautions:~~
 - (i) ~~_____ Special technical problems.~~
 - (ii) ~~_____ Additional engineering data required.~~
 - (iii) ~~_____ Permits and regulatory requirements.~~
 - (iv) ~~_____ Access, easements, right-of-way.~~
 - (v) ~~_____ Health and safety requirements.~~
 - (vi) ~~_____ Community relations activities.~~

~~(f) Cost Estimates and Schedules:~~

~~(i) Capital cost estimate.~~

~~(ii) Operation and maintenance cost estimate.~~

~~(iii) Project schedule (design, construction, and operation),
including estimated operating time required to achieve the
performance expectation.~~

~~e. Upon review of the Corrective Measures Study Report, the Department may
require the Permittee to evaluate further, and report upon, one or more additional
remedies, or develop particular elements of one or more proposed remedies. Such
further requirements will, if necessary, be incorporated into this Permit via 40
C.F.R. §§ 270.41 or 270.42.~~

ATTACHMENT P
REMEDIAL CLEANUP TARGETS
CULPEPER DISTRICT HEADQUARTERS

Table P-1: SWMU #8 – Summary of COC's for Soil, Industrial Risk-based Screening

Table P-2: SWMU #8 – Summary of COCs for Soil, Protection of Groundwater Risk-based Screening

Table P-3: SWMU #9 – Summary of COC's for Soil, Residential Risk-based Screening

Table P-4: SWMU #9 – Summary of COCs for Soil, Protection of Groundwater Risk-based Screening



TABLE P-1

**SWMU #8 - SUMMARY OF COCs FOR SOIL
INDUSTRIAL RISK-BASED SCREENING
VDOT CULPEPER DISTRICT HEADQUARTERS**

Chemical Constituent Name	CAS #	C or NC	Screening Levels*		Background	Cleanup Objectives Met By Proposed Remedy
			Industrial Soil	Industrial Soil x 0.1		
Volatile Organic Compounds by Method SW-846 8260B (mg/kg)						
Iodomethane	74884	NL	NL	NL	NA	Eliminate potential exposure pathways for contact with impacted soil
Semivolatile Organic Compounds by EPA Method SW-846 8270C (mg/kg)						
Acenaphthylene	208968	NL	NL	NL	NA	Eliminate potential exposure pathways for contact with impacted soil
Benzo[a]pyrene	50328	C	0.21	0.021	NA	Eliminate potential exposure pathways for contact with impacted soil
Benzo[g,h,i]perylene	191242	NL	NL	NL	NA	Eliminate potential exposure pathways for contact with impacted soil
Di-n-octylphthalate	74884	NL	NL	NL	NA	Eliminate potential exposure pathways for contact with impacted soil
Phenanthrene	85018	NL	NL	NL	NA	Eliminate potential exposure pathways for contact with impacted soil
Pesticide Organics by EPA Method SW-846 8081 (mg/kg)						
Toxaphene	8001352	C	1.6	0.16	NA	Eliminate potential exposure pathways for contact with impacted soil
Polychlorinated Biphenyls by EPA Method SW-846 8082 (mg/kg)						
Aroclor-1254	11097691	C	0.74	0.074	NA	Eliminate potential exposure pathways for contact with impacted soil
ICP Metals by EPA Method SW-846 6010B/6020 (mg/kg)						
Arsenic	7440382	C	1.6	0.16	6.2	Eliminate potential exposure pathways for contact with impacted soil
Chromium†	18540299	C	5.6	0.56	45.5	Eliminate potential exposure pathways for contact with impacted soil
Cobalt	7440484	NC	300	30	59.7	Eliminate potential exposure pathways for contact with impacted soil
Lead	7439921	NC	800	80	35	Eliminate potential exposure pathways for contact with impacted soil

* Screening levels obtained from Oak Ridge National Laboratory (ORNL) Regional Screening Levels (RSL) for chemical contaminants at Superfund Sites, May 2010

C: Carcinogenic, NC: Non-carcinogenic

NL: Compound not listed in the May 2010 ORNL RSL tables

NA: Not applicable

† = values for Chromium VI used in risk-based screening process

Bold: Indicates values used for risk-based screening process



TABLE P-2

**SWMU #8 - SUMMARY OF COCs FOR SOIL
PROTECTION OF GROUNDWATER RISK-BASED SCREENING
VDOT CULPEPER DISTRICT HEADQUARTERS**

Chemical Constituent Name	CAS #	C or NC	Protection of GW*		Background	Cleanup Objectives Met By Proposed Remedy
			Risk-Based SSL	MCL-Based SSL		
Volatile Organic Compounds by Method SW-846 8260B (mg/kg)						
Iodomethane	74884	NL	NL	NL	NA	Prevent migration to groundwater
Naphthalene	91203	C	0.00047	NS	NA	Prevent migration to groundwater
Semivolatile Organic Compounds by EPA Method SW-846 8270C (mg/kg)						
Acenaphthylene	208968	NL	NL	NL	NA	Prevent migration to groundwater
Benzo[a]anthracene	56553	C	0.01	NS	NA	Prevent migration to groundwater
Benzo[a]pyrene	50328	C	0.0035	0.24	NA	Prevent migration to groundwater
Benzo[b]fluoranthene	205992	C	0.035	NS	NA	Prevent migration to groundwater
Benzo[g,h,i]perylene	191242	NL	NL	NL	NA	Prevent migration to groundwater
Dibenzo[a,h]anthracene	53703	C	0.011	NS	NA	Prevent migration to groundwater
Indeno(1,2,3-c,d)pyrene	193395	C	0.12	NS	NA	Prevent migration to groundwater
Naphthalene	91203	C	0.00047	NS	NA	Prevent migration to groundwater
Phenanthrene	85018	NL	NL	NL	NA	Prevent migration to groundwater
Pesticide Organics by EPA Method SW-846 8081 (mg/kg)						
technical hch (delta-BHC)	608731	C	0.00022	NS	NA	Prevent migration to groundwater
Dieldrin	60571	C	0.00017	NS	NA	Prevent migration to groundwater
4,4'-DDT	50293	C	0.067	NS	NA	Prevent migration to groundwater
Toxaphene	8001352	C	0.0094	0.46	NA	Prevent migration to groundwater
Chlordane, Total±	12789036	C	0.013	0.14	NA	Prevent migration to groundwater
Polychlorinated Biphenyls by EPA Method SW-846 8082 (mg/kg)						
Aroclor-1248	12672296	C	0.0052	NS	NA	Prevent migration to groundwater
Aroclor-1254	11097691	C	0.0088	NS	NA	Prevent migration to groundwater
Aroclor-1260	11096825	C	0.024	NS	NA	Prevent migration to groundwater
ICP Metals by EPA Method SW-846 6010B/6020 (mg/kg)						
Antimony	7440360	NC	0.66	0.27	2.7	Prevent migration to groundwater
Arsenic	7440382	C	0.0013	0.29	6.2	Prevent migration to groundwater
Barium	7440393	NC	300	82	134	Prevent migration to groundwater



TABLE P-2

**SWMU #8 - SUMMARY OF COCs FOR SOIL
PROTECTION OF GROUNDWATER RISK-BASED SCREENING
VDOT CULPEPER DISTRICT HEADQUARTERS**

Chemical Constituent Name	CAS #	C or NC	Protection of GW*		Background	Cleanup Objectives Met By Proposed Remedy
			Risk-Based SSL	MCL-Based SSL		
Cadmium-Diet Standards	7440439	NC	NS	NS	5.15	Prevent migration to groundwater
Chromium†	18540299	C	0.00083	NS	45.5	Prevent migration to groundwater
Cobalt	7440484	NC	0.49	NS	59.7	Prevent migration to groundwater
Copper	7440508	NC	51	46	45.5	Prevent migration to groundwater
Lead	7439921	NC	NS	14	35	Prevent migration to groundwater
Nickel	7440020	NC	48	NS	25.2	Prevent migration to groundwater
Selenium	7782492	NC	0.95	0.26	ND	Prevent migration to groundwater
Vanadium & Compounds	7440622-0	NC	180	NS	256	Prevent migration to groundwater
Zinc	7440666	NC	680	NS	74.5	Prevent migration to groundwater
Mercury by EPA Method SW-846 7470A (mg/kg)						
Mercury	7439976	NC	0.03	0.1	0.142	Prevent migration to groundwater

Notes

* Screening levels obtained from Oak Ridge National Laboratory (ORNL) Regional Screening Levels (RSL) for chemical contaminants at Superfund Sites, May 2010

C: Carcinogenic, NC: Non-carcinogenic

NL: Compound not listed in the May 2010 ORNL RSL tables

NA: Not applicable

‡ = values for Chlordane used in risk-based screening process

† = values for Chromium VI used in risk-based screening process

Bold: Indicates values used for risk-based screening process



TABLE P-3

**SWMU #9 - SUMMARY OF COCs FOR SOIL
RESIDENTIAL RISK-BASED SCREENING
VDOT CULPEPER DISTRICT HEADQUARTERS**

Chemical Constituent Name	CAS #	C or NC	Screening Levels*		Background	Cleanup Objectives Met By Proposed Remedy
			Residential Soil	Residential Soil x 0.1		
Semivolatile Organic Compounds						
Benzo[a]pyrene	50328	C	0.015	0.0015	NA	Soil containing COC at concentration above RBSL removed from site
Dibenzo[a,h]anthracene	53703	C	0.015	0.0015	NA	Soil containing COC at concentration above RBSL removed from site
Indeno(1,2,3-c,d)pyrene	193395	C	0.15	0.015	NA	Soil containing COC at concentration above RBSL removed from site
Metals						
Lead	7439921	NC	400	40	35	Soil containing COC at concentration above RBSL removed from site

Notes

* Screening levels obtained from Oak Ridge National Laboratory (ORNL) Regional Screening Levels (RSL) for chemical contaminants at Superfund Sites, May 2010



TABLE P-4

**SWMU #9 - SUMMARY OF COCs FOR SOIL
PROTECTION OF GROUNDWATER RISK-BASED SCREENING
VDOT CULPEPER DISTRICT HEADQUARTERS**

Chemical Constituent Name	CAS #	C or NC	Protection of GW*		Background	Cleanup Objectives Met By Proposed Remedy
			Risk-Based SSL	MCL-Based SSL		
Semivolatile Organic Compounds						
Dibenzo[a,h]anthracene	53703	C	0.011	NS	NA	Soil containing COC at concentration above RBSL removed from site
Indeno[1,2,3-c,d]pyrene	193395	C	0.12	NS	NA	Soil containing COC at concentration above RBSL removed from site
Metals						
Lead	7439921	NC	NS	14	35	Soil containing COC at concentration above RBSL removed from site

Notes

* Screening levels obtained from Oak Ridge National Laboratory (ORNL) Regional Screening Levels (RSL) for chemical contaminants at Superfund Sites, May 2010

C Carcinogenic, NC Non-carcinogenic

NS No screening level listed in the May 2010 ORNL RSL tables

Bold Indicates values used for risk-based screening process

ATTACHMENT Q

INTERIM MEASURES REQUIREMENTS

ATTACHMENT Q

INTERIM MEASURES REQUIREMENTS

The purpose of Interim Measures is to implement corrective actions during the term of this Permit to control, abate or remove any known on-site or off-site contamination, and/or prevent the migration of contamination on, or beyond, the Facility boundary and to the extent practicable to protect human health and the environment. Interim Measures are to be consistent with, and integrated into any long-term remediation at the Facility.

1. ~~Interim Measures Workplan~~

The Permittee shall prepare and submit to the Department and the EPA Region 3 an Interim Measures Workplan that includes the development of several plans, which shall be prepared concurrently. Upon the Department's approval, the Permittee shall implement the Workplan according to the schedules contained therein.

a. ~~Interim Measures Project Management Plan~~

The Interim Measures Project Management Plan ("IMPMP") shall document the overall management approach to the Interim Measures. The IMPMP shall include, but not be limited to:

- (1) ~~Background information including a discussion of historical facility operations, the current conditions at the facility, including any interim measures which have, or are being implemented at the facility, pertinent geology, and the known nature and extent of contamination.~~
- (2) ~~A discussion of Interim Measures objectives, the technical approach to meet those objectives, and an explanation of how the interim measures will control, abate or eliminate releases and, to the extent possible, be consistent and integrated with any long-term solution at the facility.~~
- (3) ~~A description of the qualifications of personnel directing or performing the Interim Measures, including contractor and subcontractor personnel.~~
- (4) ~~A project schedule identifying dates for the anticipated completion of the project and the submission of all documents referenced in this Attachment, including, but not limited to an Interim Measures Design Program containing Design Plans and Specifications, an Operations and Maintenance Plan, a Sampling and Analysis Plan (if necessary), progress reporting, and an Interim Measures Implementation Report.~~

b. ~~Community Relations Plan~~

The Permittee shall prepare a fact sheet describing the scope and objectives of the

~~Interim Measures to be performed under the Interim Measures Workplan as approved by the Department. The Community Relations fact sheet shall be submitted to the Department and the EPA Region 3. The Permittee shall mail this fact sheet to all persons on the Facility mailing list compiled under 40 C.F.R. § 124.10(c)(1)(ix) and to the appropriate units of State and local governments, to all individuals who own or reside on the land that are contiguous to the Facility, and to individuals who own or reside on land in the other nearby areas to be investigated under the RFI. The mailing of the fact sheet regarding Interim Measures should be at least ten (10) business days prior to the start of field activities for Interim Measures, unless immediate measures are needed to address an imminent threat to human health or the environment in accordance with Permit Section VI.H., Emergency Response; Release Reporting.~~

e. ~~Health and Safety Plan~~

~~The Permittee shall develop a Health and Safety Plan in accordance with Attachment S to this Permit. The Health and Safety Plan shall be submitted to the Department and the EPA Region 3. If the Department deems it appropriate, Permittee may reference or amend a previous Health and Safety Plan submitted pursuant to this Permit.~~

2. ~~Interim Measures Design Program~~

a. ~~Design Documentation and Specifications~~ ~~The Permittee shall submit to the Department and the EPA Region 3 the Interim Measures design documentation and specifications, which include, but are not limited to:~~

- ~~(1) The design strategy and the design basis, including measures of compliance with all applicable or relevant environmental and public health standards.~~
- ~~(2) The technical factors of importance, including but not limited to materials, equipment and specifications.~~
- ~~(3) The assumptions made and detailed justification of these assumptions.~~
- ~~(4) The possible sources of error, references to possible operation and maintenance problems and anticipated remedies.~~
- ~~(5) Detailed drawings including facility layout, utility locations, engineering controls which aid in the safe operation of the IM, sample calculations, derivations of equations essential to understanding the report and results of laboratory or field tests.~~

b. ~~Operation and Maintenance Plan~~

Permittee shall prepare an Operation and Maintenance Plan to cover both implementation and long-term maintenance of the Interim Measure(s). The Operations and Maintenance Plan shall be submitted to the Department and the EPA Region 3. The plan shall be composed of:

- (1) — Description of the equipment and its normal operation and maintenance (O&M), including a schedule showing frequency of each O&M task.
- (2) — Description of routine monitoring and laboratory testing, the required QA/QC, and a schedule of monitoring frequency and equipment replacement.
- (3) — Records and reporting mechanisms required, including daily operating logs, laboratory records, mechanism for reporting equipment breakdown, failure and emergencies related to the implementation of the interim measure, personnel and maintenance records and monthly/annual reports to Federal/state agencies.

e. — Sampling and Analysis Plan

If any sampling and analysis is required to implement the interim measures, Permittee must include in the Interim Measure Workplan a Data Collection Quality Assurance Plan and a Data Management Plan. These two plans shall be submitted in accordance with the requirements of Attachment R to the Department and the EPA Region 3.

If the Department has previously approved a Sampling and Analysis Plan pursuant to a RFI or previous IM, and if the Department deems it appropriate, Permittee may reference or amend the relevant portions of the approved Plan. The Sampling and Analysis Plan shall describe the methods and frequency for collecting and analyzing samples for monitoring the effectiveness and efficiency of the ongoing Interim Measures. At a minimum it shall describe the number of samples collected, including QA/QC samples, the location of the samples collected, the method of collection, frequency of sampling activities, decontamination procedures, and a constituent analysis list.

3. — Reports

a. — Interim Measures Workplan

Permittee shall submit an Interim Measures Workplan as described in this Attachment to the Department and the EPA Region 3.

b. — Progress Reports

Permittee shall submit IM Progress Reports to the Department and the EPA Region 3 in accordance with an approved schedule described in the IMPMP of Section 1.a. of this Attachment. The progress reports shall contain:

- (1) ~~A description and estimate of the percentage of the interim measures completed.~~
- (2) ~~Summaries of all findings.~~
- (3) ~~Summaries of all changes made in the Interim Measures during the reporting period.~~
- (4) ~~Summaries of all contacts with representative of the local community, public interest groups, or state government during the reporting period.~~
- (5) ~~Summaries of all problems or potential problems encountered during the reporting period.~~
- (6) ~~Actions being taken to rectify problems.~~
- (7) ~~Changes in personnel during the reporting period.~~
- (8) ~~Projected work for the next reporting period.~~
- (9) ~~Copies of daily reports, inspection reports, laboratory/monitoring data, etc.~~

e ~~Interim Measures Implementation Report~~

~~At the "completion" of the construction of the project, Permittee shall finalize the Interim Measures Workplan, and submit for the Department's approval a Draft Interim Measures Implementation Report (IMIR) in accordance with the schedule described in Section 1.a.(4) of this Attachment. A copy of the IMIR shall be submitted to the EPA Region 3. The IMIR shall document that the project is consistent with the design specifications and that the interim measures are performing adequately. The IMIR shall include, but not be limited to:~~

- (1) ~~Synopsis of the interim measures and certification of the design and construction.~~
- (2) ~~Explanation of any modifications to the plans and why these were necessary for the project.~~
- (3) ~~Listing of the criteria, established before the interim measures were initiated, for judging the functioning of the interim measures and also for explaining any modification to these criteria.~~

~~(4) Results of facility monitoring, indicating that the interim measures will meet or exceed the performance criteria.~~

~~(5) Summary of the operation and maintenance (including monitoring) to be undertaken at the facility.~~

~~In addition to the above information, the IMIR shall include the inspection summary reports, inspection data sheets, problem identification and corrective reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications (with justifying documentation), and as built drawings.~~

~~(6) The Permittee shall respond to any comments received from the Department on the draft IMIR submission.~~

ATTACHMENT R

QUALITY ASSURANCE AND QUALITY CONTROL REQUIREMENTS

ATTACHMENT R

QUALITY ASSURANCE AND QUALITY CONTROL REQUIREMENTS

~~The Permittee shall submit a Sample Collection Methods and Procedures Plan(s), Quality Assurance Project Plan(s), Laboratory Data Package(s), and Data Management Plan as specified in this Attachment to the Department and the EPA Region 3. These plans must be approved by the Department in accordance with conditions I.C. (Approval/Disapproval of Submissions) of this Permit.~~

~~1. Sample Collection Methods and Procedures Plan. The Permittee shall:~~

~~a. Describe the samplers or sampling equipment for each environmental media and/or waste matrix to be sampled at each SWMU.~~

~~b. Describe the sampling procedure for each environmental media and/or waste matrix in explicit detail. Include, but not be limited to, procedures and methods for work such as bailing, drilling holes, etc.:~~

~~(1) Describe the sequence to be followed in conducting the field activities.~~

~~(2) Include quality assurance samples for analysis at the rate specified.~~

~~(a) Equipment Blank. One with each sampling event for each matrix type.~~

~~(b) Trip Blank. One with each analytical volatile batch for each matrix type.~~

~~(c) Field Blank. One with each analytical batch or every 20 samples, whichever is greater.~~

~~(d) Replicates (see Figure 1). One with each analytical batch or every 20 samples, whichever is greater.~~

~~(3) Identify the type and source of the sample containers to be used for each analytical parameter.~~

~~(4) Detail the sample preservation methods to be utilized and state the maximum permissible holding times to be allowed for each analytical parameter prior to analysis.~~

~~(5) Describe the sample custody procedures starting with the cleaning of sample containers to be used, and provide an example "chain of custody" form.~~

- ~~(6) — Detail the sampling equipment decontamination procedures to be utilized.~~
- ~~(7) — Describe what will be done with disposable equipment contaminated on site and how contaminated materials will be disposed of, including contaminated environmental media.~~
- e. ~~Identify the analytical laboratory to be used, which has a documented Quality Assurance Program, to be used.~~
- d. ~~Identify in the Quality Assurance Project Plan all sample preparation, cleanup (if any) and analytical methods to be used.~~
 - ~~(1) — Analytical methods utilized must be capable of achieving the screening levels specified in Attachment N, and the data quality requirements specified in the approved method. The need for deviation from any of these criteria must be fully documented in the Quality Assurance Project Plan and submitted to the Department for approval prior to conducting any sampling events.~~
 - ~~(2) — Test methods for analyses of hazardous constituents have been standardized by EPA in its publication, Test Methods for Evaluating Solid Wastes: Physical/Chemical Methods (SW 846), 3rd Edition as updated. Any other appropriate standardized method may be used by the Permittee provided the alternate method is capable of producing the required level of data quality and so long as the method adheres to the quality assurance requirements in this Attachment. Non-standardized methods may be used with prior Department approval provided the Permittee submits a comprehensive description of the test method along with data from tests designed to evaluate equivalency with standard methods. This data shall include a statistical analysis of the equivalency test data.~~
- e. ~~Use, at a minimum, the quality control procedures found in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW 846), 3rd Edition as updated.~~
- 2. ~~Quality Assurance Project Plan: the Quality Assurance Project Plan shall fulfill the following minimum requirements—~~
 - a. ~~The Permittee shall have a Quality Assurance program for ensuring that all information, data and decisions resulting from the RCRA Facility Investigation, Interim Measures and/or Corrective Measure Study are technically sound and properly documented.~~
 - b. ~~The Permittee shall use an analytical laboratory, which has a documented Quality Assurance Program.~~

- c. ~~The Permittee shall prepare a Quality Assurance Project Plan for each data collection project or continuing activity, utilizing guidelines and specifications found in EPA's document Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans QAMS 005/80. The Plan shall address the 16 plan elements discussed in Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans QAMS 005/80, which are as follows:~~
- ~~(1) Title page, introduction.~~
 - ~~(2) Table of contents.~~
 - ~~(3) Project description.~~
 - ~~(4) Project organization.~~
 - ~~(5) Quality assurance objectives for data measurement.~~
 - ~~(6) Sampling procedure.~~
 - ~~(7) Sample and document custody procedures.~~
 - ~~(8) Calibration procedures and frequency.~~
 - ~~(9) Analytical procedures.~~
 - ~~(10) Data reduction, validation and reporting.~~
 - ~~(11) Internal quality control checks.~~
 - ~~(12) Performance and system audits.~~
 - ~~(13) Preventive maintenance.~~
 - ~~(14) Data measurement assessment procedures.~~
 - ~~(15) Corrective Action.~~
 - ~~(16) Quality assurance reports to management.~~
3. ~~Laboratory Data Package The Permittee shall ensure that the laboratory(s) analyzing samples required by this Permit shall use the methods identified in the Department's approved Quality Assurance Project Plan, and submit the required deliverables. The laboratory data package shall include:~~
- a. ~~A Quality Control Summary including:~~

- ~~_____ (1) _____ Methods Summary~~
- ~~_____ (2) _____ Surrogate Recoveries~~
- ~~_____ (3) _____ Matrix Spike/Matrix Spike Duplicate Recoveries~~
- ~~_____ (4) _____ Method/Trip/Field/Blank Results~~
- ~~_____ (5) _____ Storage~~

~~b. _____ A Sample Data Section including:~~

- ~~_____ (1) _____ Specific Compound Results~~
- ~~_____ (2) _____ Results of Tentatively Identified Compound Analysis~~
- ~~_____ (3) _____ Detection Limits~~
- ~~_____ (4) _____ Sample Analysis Dates~~

~~e. _____ The Permittee shall provide data validation of analyses done by the laboratory(ies) (to be described in the Quality Assurance Project Plan). This data validation shall determine data acceptability and shall be performed in accordance with EPA's Functional Guidelines for Data Review for data derived by Contract Laboratory Procedure Methods (Region III Modifications to National Functional Guidelines for Organic Data Review, US EPA Region III Central Regional Laboratory, June 1992 and Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses, Hazardous Site Evaluation Division, US EPA, June 13, 1988). If another method is used, the data validation shall be performed~~

~~in accordance with the QA/QC data validation criteria set forth in that method. For methods lacking QA/QC data validation protocols, the Permittee must establish validation criteria such as those in Section 8 of the EPA Series Methods in 40 C.F.R. Part 136. The appropriate quality assurance data validation summary reports shall be submitted to the Department, along with sample data and summary sheets and final sample results.~~

~~4 _____ Data Management Plan~~

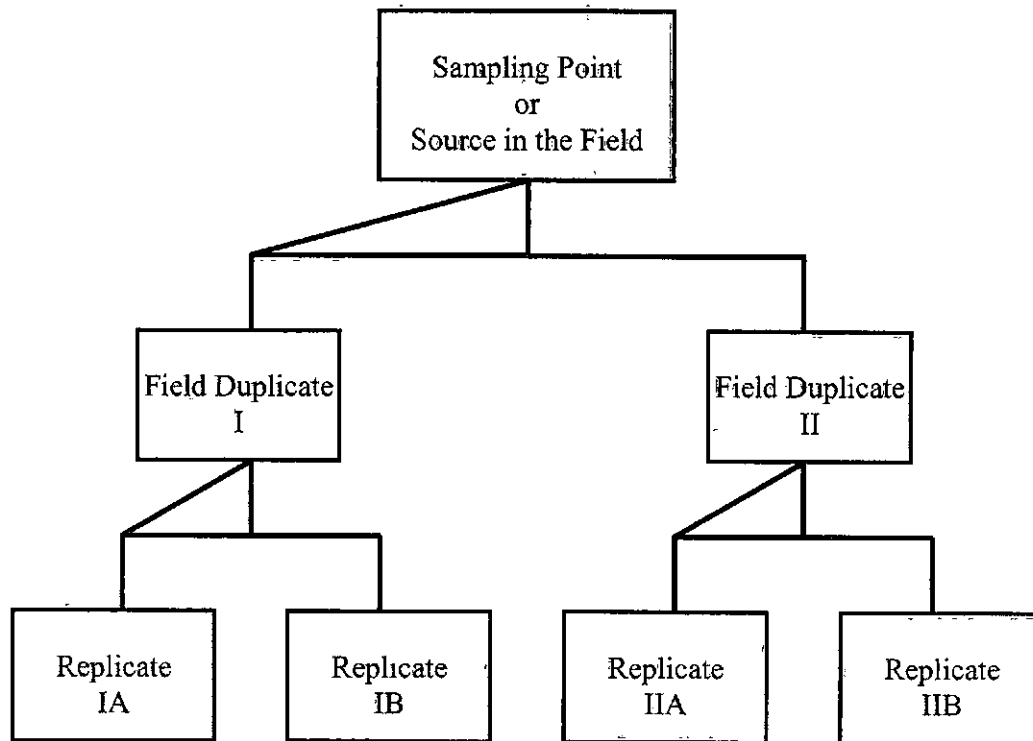
~~_____ The Permittee shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.~~

- ~~a. Data Record The Data Record shall include the following:~~
- ~~(1) Unique sample or field measurement code.~~
 - ~~(2) Sampling or field measurement location and sample or measurement type.~~
 - ~~(3) Sampling or field measurement raw data.~~
 - ~~(4) Laboratory analysis ID Number.~~
 - ~~(5) Property or component measured.~~
 - ~~(6) Result of analysis (e.g., concentration).~~
- ~~b. Tabular Displays The following data shall be presented in tabular displays:~~
- ~~(1) Unsorted (raw) data.~~
 - ~~(2) Results for each medium, or for each constituent monitored.~~
 - ~~(3) Data reduction for numerical analysis.~~
 - ~~(4) Sorting of data by potential stratification factors (e.g., location, soil layer, topography).~~
 - ~~(5) Summary data.~~
- ~~c. Graphical Displays The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc):~~
- ~~(1) Display sampling location and sampling grid.~~
 - ~~(2) Indicate boundaries of sampling area, and areas where more data are required.~~
 - ~~(3) Display levels of contamination at each sampling location.~~
 - ~~(4) Display geographical extent of contamination.~~
 - ~~(5) Display contamination averages, and maximum levels.~~
 - ~~(6) Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters.~~
 - ~~(7) Indicate features affecting transport between media and show potential~~

receptors

~~The Permittee shall ensure that the Department's personnel and/or authorized representatives are allowed reasonable access to the laboratory (ies), records and personnel utilized by the Permittee for analysis of samples collected pursuant to this Permit. Furthermore, nothing shall preclude the Department from requiring Permittee's laboratory to submit to a Performance Evaluation sample analysis, or from requiring the Permittee to furnish split samples to the Department during a sampling event.~~

Figure R-1 Duplicates vs Replicates



Duplicates are collected in the field

Replicates are analyzed in the laboratory

ATTACHMENT SN

HEALTH AND SAFETY PLAN REQUIREMENTS

ATTACHMENT SN

HEALTH AND SAFETY PLAN REQUIREMENTS

The Permittee shall prepare a facility Health and Safety Plan for Corrective Action RCRA Facility Investigations (RFIs) and Corrective Measures activities at the Permitted facility and shall submit to the Department and the EPA Region 3. Compliance with the Occupational Safety and Health Administration (OSHA) Regulations is not under the jurisdiction or the authority of the Department or the EPA in the Commonwealth of Virginia. Therefore, the Health and Safety Plan submittal to the Department and the EPA Region 3 is for the administrative record only and the submittal will not receive approval nor disapproval by the Department or the EPA

In the Commonwealth of Virginia, compliance and enforcement of the OSHA regulations under 29 C.F.R. 1910.120, falls under the authority of the Virginia Office of Safety and Health, the Virginia Department of Labor and Industry. Therefore, the above office should be contacted to determine the major elements and requirements for a Health and Safety Plan under the OSHA Regulations.

**POST-CLOSURE PERMIT
VIRGINIA DEPARTMENT OF TRANSPORTATION
CULPEPER HEADQUARTERS
VAD980715064**

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ATTACHMENT J- MONITORING CONSTITUENT LIST

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TABLE P-3: SWMU#9 – SUMMARY OF COC'S FOR SOIL, RESIDENTIAL
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ATTACHMENT Q- COMMUNITY RELATIONS PLAN

ATTACHMENT R – CORRECTIVE ACTION PROGRAM SUBMITTAL FOR REGULATED
UNITS (Paint Pit and Sign Shop Vat - HWMUS) (RUCA), dated
7/23/2009, 8/28/2009, and 1/26/2010 – (Incorporated by Reference.)

MODULE II
GENERAL FACILITY CONDITIONS

II.A. DESIGN AND OPERATION OF FACILITY

The Permittee shall maintain and operate the Culpeper District Headquarters whose location is shown by the facility map and topographic map and recorded on the survey plat (**Permit Attachments B and C**) to minimize the possibility of a fire, explosion, or any unplanned sudden or nonsudden release of hazardous waste constituents to air, soil, groundwater or surface water which could threaten human health or the environment.

II.B. GENERAL WASTE ANALYSIS

Wastes managed in the Sign Shop Vat consisted of spent solvents that were discharged from a soaking trough. Reportedly, 60 gallons of fresh solvent were added to the trough annually. Waste generated at the Sign Shop was referred to as a "xylene waste mixture". Approximately 420, 55-gallon drums of waste paint containing out-of-date paint, dried paint solids, "skims" of semi-solid paint were excavated and removed.

A list of all hazardous wastes which were ever known to have been placed in the waste management units is provided in the List of Wastes, **Permit Attachment D**. This list is based upon information provided by the facility.

II.C. SECURITY

The Permittee shall comply with the security provisions of 40 CFR 264.14. The security provisions shall follow the requirements described in **Permit Attachments E and F**.

II.D. GENERAL INSPECTION REQUIREMENTS

The Permittee shall follow the inspection plan set out in **Permit Attachment G**. The Permittee shall remedy any deterioration or malfunction discovered by an inspection (40 CFR 264.15). Inspection records shall be kept as required by 40 CFR 264.15(d).

II.E. PERSONNEL TRAINING

The Permittee shall conduct required personnel training (40 CFR 264.16). This training program shall follow **Permit Attachment H** and the Permittee shall

maintain training documents and records (40 CFR 264.16(e)).

II.F. RECORDKEEPING AND REPORTING

II.F.1. Operating Record.

The Permittee shall maintain a written operating record at the facility in accordance with 40 CFR 264.73. The record can be a compilation of various documents and shall include, but not be limited to, the information listed below.

- a. The following records shall be maintained until post-closure is complete and certified:
 1. Records of spills and releases required by existing environmental laws, including, but not limited to § 103 of the Comprehensive Environmental Response, Compensation and Liability Act;
 2. Written reports and records of verbal notification to the Director to address releases, fires, and explosions;
 3. All reports of noncompliance pursuant to **Permit Section I.H.11**;
 4. All submittals prepared pursuant to **Permit Section I.H.12**;
 5. Records of all monitoring information pursuant to **Permit Section I.E**; and
 6. Training records of current Facility personnel.
- b. The following records shall be maintained for a minimum of 3 years. This time period may be extended by the Department in the event of enforcement action or notification by the Department that an investigation is ongoing.
 1. Generator Biennial Reports submitted in compliance with 40 CFR Section 262.41;
 2. Facility Annual Reports submitted in compliance with 40 CFR 264.75;
 3. Training records of former Facility personnel; and
 4. Records of all inspections, pursuant to 40 CFR 264.15, which shall include at a minimum:
 - i. The date and time of the inspection;

- ii. The name of the person performing the inspection;
 - iii. A notation of the observations made; and
 - iv. The date and nature of any repairs or remedial actions.
- c. Current copies of the following documents as amended, revised, and modified shall be maintained at the Facility until post-closure and corrective action are complete and certified:
- 1. All closure, post-closure, interim measures, and final corrective action cost estimates

II.F.2. Required Reports.

The Permittee shall comply with all applicable reporting requirements as described in **Permit Sections I.E and I.H.**

MODULE VI
SITE-WIDE CORRECTIVE ACTION

**VI.A. CORRECTIVE ACTION FOR CONTINUING RELEASES;
PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT**

VI.A.1. Section 3004(u) of RCRA, 42 U.S.C. § 6924(u), and regulations codified at 40 CFR §264.101, provide that all permits issued after November 8, 1984 must require corrective action as necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any solid waste management unit (SWMU), regardless of when waste was placed in the unit.

VI.A.2. Under Section 3004(v) of RCRA, 42 U.S.C. § 6924(v), and 40 CFR §264.101(c), the Department may require that corrective action at a permitted facility be taken beyond the facility boundary where necessary to protect human health and the environment, unless the owner or operator of the facility concerned demonstrates to the satisfaction of the Department that, despite the owner or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake such action.

VI.A.3. Section 3005(c)(3) of RCRA, 42 U.S.C. § 6925(c)(3), and 40 CFR § 270.32(b) provide that each permit shall contain such terms and conditions as the Department determines necessary to protect human health and the environment.

VI.B. CORRECTIVE MEASURES IMPLEMENTATION

V.B.1. Background

The VDOT Culpeper District Headquarters has been in operation since the late 1930's, and has historically been used for storage/maintenance of VDOT vehicles, storage of materials, road sign production and various administrative/dispatch services. Three hazardous waste management units (HWMUs) were previously operated on the facility, and were closed in the late 1990's. Residual impact to groundwater from principally volatile organic compounds (VOCs) was identified at two of the three HWMUs (Paint Pit and Sign Shop Vat). A HWMU Post-closure Care Permit was issued for the facility on September 14, 2005. On September 21, 2010, a Class III Permit Modification was adopted to accept and outline requirements for implementation of a Corrective Action Program to address the select VOCs identified in groundwater beneath the two HWMUs. The remedy, as described in Module VII, is monitored natural attenuation (MNA), and the required semi-annual monitoring and reporting has been conducted since that time.

Ten (10) Solid Waste Management Units (SWMUs) have been identified at the facility, and labeled as SWMUs 1-10. A listing and description of the SWMUs are provided in Attachment M. Prior to the issuance of the HWMU Post-Closure Care Permit, environmental investigations/remediation activities were performed at several of the SWMUs including

SWMUs 1-7, and 9. As per the requirements set forth in the permit, a Phase I RCRA Facility Investigation (Phase I RFI) was conducted pursuant to the Phase I RCRA Facility Investigation (RFI) Work Plan (July 7, 2006, revised June 28, 2007) to assess conditions at SWMU 8 and 10, as well as to assess current groundwater conditions at SWMUs 1-7. VDOT elected to prepare an Interim Measures (IM) Work Plan (December 9, 2009) for SWMU 9, and no further assessment was performed during the Phase I RFI. Subsequent to completing the scope of work outlined in the Phase I RFI Work Plan, various follow-up investigations were performed at SWMU's 7, 8 and 10. Results of all RFI-related investigations were summarized in various reports submitted to VADEQ. VDOT also prepared an Evaluation of Potential Future Land Use (December 6, 2011), and an industrial land-use scenario was approved for the facility. Based in the results of the RFI-related investigations and consideration of industrial land use, corrective action was deemed necessary to address impacted soil identified at SWMU 8. The principal COCs associated with SMU8 included select VOCs, metals, PAHs, pesticides and PCBs. A Corrective Measures Study (CMS) was conducted and a remedy proposed in the CMS documentation submitted to VADEQ (May 31, 2013; Revised August 1, 2013). The CMS also incorporated the remedial measures that had been outlined in the IM Work Plan for SWMU 9. Additional assessment and corrective action background information is provided in Attachment A.

VI.B.2 Final Remedy Selection

- a. Based on the findings set forth in the RFI and CMS documents, VDEQ has determined that past operations at the Facility have resulted in impacts to soil at SWMUs 8 and 9. Constituents of Concern (COCs) are provided in Attachment P.

The final remedy for the Facility emphasizes source control through the following activities: excavation of impacted soils in SWMU 9; construction and long term maintenance of an engineered cover in SWMU 8 to prevent exposure to impacted soil and to inhibit infiltration of precipitation through the impacted soil; continued groundwater monitoring at the two HWMUs in accordance with Module VII of this Permit; and the implementation of institutional controls (ICs). The final remedy for the Site was developed based on the CMS results and the Administrative Record, and is described in the Statement of Basis, issued by the Department dated June 13, 2014. The requirements of this Permit provide for the implementation and maintenance of the remedy described in the Statement of Basis.

- b. The Corrective Action objective for the impacted soil at the Facility is to prevent human and environmental exposure to the COCs, and to control potential COC migration. The remediation goals for soil at SWMU 9 are based on unrestricted land use scenario and protection of groundwater. The remediation goals for soil at SWMU 8 are based on an industrial land use scenario and protection of groundwater. The soil remediation goals for SWMU 8 and 9 are provided in Attachment P.
- c. The final remedy for SWMU 8 and 9 will be described in more detail in the site-specific Corrective Measures Implementation Work Plan required by this Permit. Minor modifications to the activities, studies, techniques, procedures, designs and schedules

utilized, as applicable, in carrying out the requirements of this Permit and necessary for the completion and maintenance of the remedy may be made by agreement between DEQ and VDOT.

VI.B.3. Final Remedy Implementation

- a. Within ninety (90) days of receipt of the Department's written approval of the Permit modification incorporating the Final Remedy the Permittee shall submit a Corrective Measure Implementation (CMI) Work Plan for the covering of SWMU 8 and excavation of SWMU 9, inspection and maintenance of the cover, groundwater monitoring of the two HWMUs, as well as the implementation of ICs, and additional property use restrictions. ICs and additional restrictions to be used at the site shall:
 - i. notify prospective buyers of the property of the environmental conditions at the Facility and of VDEQ's selected corrective measures as part of the remedy for the Facility under RCRA Corrective Action;
 - ii. prohibit the use of groundwater beneath the property for potable and sanitary purposes to support selected corrective measures;
 - iii. require inspection and maintenance of the cover over SWMU 8;
 - iv. all earth moving activities, including excavation, drilling and construction activities in SWMU 8 shall be conducted in such a manner that such activities will not pose a threat to human health and the environment or adversely affect or interfere with the Final Remedy, and provided VDEQ's prior written approval; and
 - v. If it is determined that vapor intrusion poses a threat to human health, a vapor intrusion control system, the design of which shall be approved in advance by VDEQ, shall be installed in each new structure constructed above the contaminated groundwater plume or within 100-foot around the outermost wells exhibiting concentrations above the GPS,.
- b. The Permittee shall, at a minimum, provide coordinate surveys for applicable property use restrictions that meet the following requirements:
 - Define the boundary of each use restriction as a polygon
 - Establish the longitude and latitude of each polygon vertex as follows
 - Decimal degrees format
 - At least seven decimal places
 - Negative sign for west longitude
 - WGS 1984 datum
- c. A notification to prohibit well drilling under Virginia's Private Well Regulations, 12VAC 5-630-380 will be provided to the local health district (Town of Culpeper) in writing

describing the nature and extent, including a map, of the contaminated groundwater located on the Facility property. An updated notice will be prepared and submitted if significant changes occur to the contaminated groundwater plume boundary. A copy of the notification will be provided to VDEQ.

- d. Upon completion of construction and upon an initial period of performance of monitoring the corrective measure(s), the Permittee shall prepare and submit copies of the final CMI Report to the Department which delineates the implemented corrective measures, design, operation and maintenance, and performance of the constructed system(s) and complies with the requirements delineated in **Attachment O**. Final plans and specifications of the corrective measures system for SWMU 8 shall be certified by a Professional Engineer registered with the Commonwealth of Virginia and shall be submitted to the Department with the final CMI Report.
- e. CMI Progress Reports shall be provided on an annual basis to the Department as delineated in accordance with **Attachment O**.

VI.C. EVALUATION OF THE SELECTED REMEDY

Commencing one year from the submittal date of the final CMI Report, the Permittee shall submit an annual progress report by March 1st of each following year on the corrective measure(s) remedy performance as a component of the annual groundwater monitoring report. If the Department determines that the selected remedy will not comply with the media clean-up requirements, the Department may require the Permittee to perform additional studies and/or perform modifications to the existing Corrective Action remedy. If necessary, the Department or the Permittee may seek modification of this Permit pursuant to 40 C.F.R. § 270.41 or § 270.42 and § 124.5 to implement modifications to the existing Corrective Measures Remedy.

VI.D. EMERGENCY RESPONSE; RELEASE REPORTING

VI.D.1. Emergencies

If, at any time during the term of this Permit, the Permittee discovers that a release of hazardous waste or hazardous constituents at or from the Facility is presenting or may present an imminent and substantial endangerment to human health or the environment, the Permittee shall:

- a. Notify the Department as soon as practicable of the source, nature, extent, location, and amount of such release, and the endangerment posed by such release and the actions taken and/or to be taken, to the extent known, to address such release. Such notification shall be confirmed in writing within three (3) days of discovery of such release.
- b. Unless otherwise directed by the Department, immediately take such actions as are necessary and appropriate to address such release.

VI.D.2. Releases

The Permittee shall notify the Department in writing of the nature, source, extent location of a release of hazardous waste or hazardous constituents at or from the Facility within seven (7) days of discovery of such release which:

- a. Is not being addressed by corrective measures at the time of such discovery.
- b. Is not being addressed pursuant to **Permit Section VI.D--Emergency Response; Release Reporting.**

VI.D.3. If, based on the information submitted in **Permit Section VI.D.2**, a release has not been adequately remediated to be protective of human health and the environment, the Department may require the SWMU/AOC to be included in an ongoing RCRA Facility Investigation or may require Interim Measures.

VI.D.4. Nothing in this Permit shall limit the Department's authority to undertake or require any person to undertake response action or corrective action under any law, including but not limited to, Sections 104 or 106 of CERCLA, 42 U.S.C. §§ 9604 or 9606, and Section 7003 of RCRA, 42 U.S.C. § 6973. Nothing in this Permit shall relieve the Permittee of any obligation it may have under any law, including, but not limited to, Section 103 of CERCLA, to report releases of hazardous waste, hazardous constituents or hazardous substances to, at or from the Facility.

VI.E. **GUIDANCE DOCUMENTS**

Any corrective action performed at the facility shall be in general accordance with applicable EPA RCRA Corrective Action Guidance available at:
<http://www.epa.gov/reg3wcmd/ca/caresources.htm>

VI.F. **SOLID WASTE MANAGEMENT UNIT (SWMU) ASSESSMENT**

VI.F.1. The Permittee shall notify the Department, in writing, of any newly identified SWMU at the Facility, no later than thirty (30) days after the date of discovery. The notification shall include, but not be limited to, the following known information:

- a. A description of the SWMU type, function, dates of operation, location (including a map), design criteria, dimensions, materials of construction, capacity, ancillary systems (e.g., piping), release controls, alterations made to the unit, engineering drawings, and all closure and post-closure information available, particularly whether wastes were left in place.

- b. A description of the composition and quantities of solid wastes processed by the units with emphasis on hazardous wastes and hazardous constituents.
 - c. A description of any release (or suspected release) of hazardous waste or hazardous constituents originating from the unit. Include information on the date of release, type of hazardous waste or hazardous constituents, quantity released, nature of the release, extent of release migration, and cause of release (e.g., overflow, broken pipe, tank leak, etc.). Also, provide any available data that quantifies the nature and extent of environmental contamination, including the results of soil and/or groundwater sampling and analysis efforts. Likewise, submit any existing monitoring information that indicates releases of hazardous waste or hazardous constituents has not occurred or is not occurring. The Permittee may refer to information regarding releases previously submitted to the Department under **Permit Section VI.D.**
 - d. A discussion of the need for and feasibility of implementing interim measures immediately.
- VI.F.2. Upon receipt of the notification of any newly identified SWMU, the Department will determine the need for corrective action at such SWMU. If corrective action is necessary to protect human health or the environment, the Department will determine whether a RCRA Facility Investigation will be performed and the need for and scope of any Interim Measures for a newly identified SWMU.
- VI.F.3. Within sixty (60) days after receipt of the Director's determination that a RCRA Facility Investigation or Interim Measure is necessary, the Permittee shall submit a RCRA Facility Investigation Plan or Interim Measures Workplan that meets the applicable guidance. The Department's determination shall either specify the media and/or parameters to be investigated or shall require the Permittee to propose and justify the selection of media and/or parameters.
- VI.F.4. Within the time specified in the approved RCRA Facility Investigation (RFI) or Interim Measures (IM) Work Plan, the Permittee shall submit the RFI or IM Report. The RFI or IM Report will provide all data necessary for the Department to determine whether a Corrective Measures Study (CMS) or additional IM Work Plan is required.
- VI.F.5. In lieu of a separate RCRA Facility Investigation, the Permittee may propose to incorporate any newly identified SWMU into of the ongoing corrective measures. Any such proposal shall be submitted to the Department along with notification of the discovery of the SWMUs.

VI.F FINANCIAL ASSURANCE

In accordance with 40 CFR 264.140(c), the Facility is exempt from financial assurance requirements.

VI.G. RECORDKEEPING

Upon completion of closure of any SWMU, the Permittee shall maintain in the Facility operating record, documentation of the closure measures taken.

VI.H. ACCESS FOR CORRECTIVE ACTION OVERSIGHT

The Department and its authorized representatives shall have access to the Facility at all reasonable times for the purpose of monitoring compliance with the provisions of this Permit. The Permittee shall use its best efforts to obtain access to property beyond the boundaries of the Facility at which corrective action is required by this Permit (see Section 3004(v) of RCRA, 42 U.S.C. § 6924(v) and 40 CFR 264.101(c)); (1) for itself and any contractor of the Permittee for the purpose of taking corrective action required by this Permit, and (2) for Department and its authorized representatives for the purposes described in this paragraph.

VI.I. COMPLETION OF REMEDY

Within ten (10) days of receipt of notification by the Department that the remedy is complete, the Permittee shall submit a written certification to the Department via registered mail stating that the remedy has been completed in accordance with the requirements of this Permit Modification. The certification must be signed by the Permittee and by an independent registered professional engineer registered in the Commonwealth of Virginia.

In cases where no other permit conditions remain, the Permit may be modified not only to reflect the completion determination, but also to change the expiration date of the Permit to allow earlier permit expiration in accordance with 40 CFR Parts 124, 270.41, and 270.42, as applicable.

ATTACHMENT A
DESCRIPTION AND
CORRECTIVE ACTION BACKGROUND

ATTACHMENT A

FACILITY DESCRIPTION AND CORRECTIVE ACTION BACKGROUND

Facility Description

The Culpeper District Headquarters is located in the Town of Culpeper, Culpeper County, Virginia. A map depicting the location of the facility is provided as Figure 3, Attachment B. The Facility is owned and operated by the Virginia Department of Transportation (VDOT), and is comprised of several office buildings, garages, and various storage areas/buildings situated on a 52.8-acre parcel of land. Figure 4, Attachment B, depicts the general layout of the facility. The Culpeper District headquarters facility has been in operation since the late 1930's. Various activities conducted or historically conducted at the site include storage/maintenance of VDOT vehicles, storage of materials, sign production, and various administrative/dispatch services.

The facility address and contact information is provided below:

VDOT Culpeper District Headquarters
1601 Orange Road
Culpeper, VA 22701
(540) 829-7500

The VDOT Central Office is located in Richmond, VA at the following address

Virginia Department of Transportation
1401 East Broad Street
Richmond VA 23219-2000

Corrective Action Background

Regulated Units

Unit Closure

A closure and post-closure plan ("Clean Closure, Contingent Closure, and Contingent Post-closure Plans-Revision 1, Hot Vat Stripper Ditch Area", dated August 8, 1997) was submitted to VADEQ for the HVSD. The referenced plan was implemented during December of 1998. The results of the closure sampling were summarized in the closure certification report dated July 8, 1999 and titled "Closure Report, Paint Pit Area and Hot Vat Stripper Ditch Waste Management Units, Culpeper VDOT, Culpeper, Virginia". Based on the data evaluation and associated risk assessment, it was recommended to clean-close the unit for soils with unrestricted land use. VADEQ approved the risk-based clean-closure of the unit as per correspondence dated August 30, 2000. A copy of the correspondence is provided in Appendix A.

Closure of the SSV was conducted in two phases, one prior to the execution of the RCRA Compliance Agreement and the other subsequent to execution of the RCRA Compliance Agreement. The initial phase of closure was performed in late 1993 and 1994. This phase

included removal of contaminated groundwater that had backed up into the tank, removal of the concrete covering the tank, high-pressure spray washing of the concrete block walls, collection of the wash water, and removal of the block walls and a portion of the drain line. In addition, approximately 2 feet of soil was removed from the sidewalls and bottom of the tank after the block walls had been removed. Approximately 12,000 gallons of contaminated groundwater including all decontamination rinseates, and 45 tons of contaminated debris and soil were disposed in accordance with applicable regulations.

The second phase of closure of the SSV was performed in accordance with the June 4, 1998 plan titled "Clean Closure, Contingent Closure, and Contingent Post-closure Plan – Sign Shop Vat Area: Revision 3, VDOT-Culpeper District Headquarters Facility". This document also provided detail regarding the earlier closure activities associated with the unit. The plan provided for completing closure of the unit by removal of all remaining physical components of the SSV including the concrete flooring of the storage building, all components of the drainfield, associated piping and contaminated soil. Closure activities began on November 3, 1998 and concluded on December 3, 1998. In total, the excavation area encompassed 4,543 square feet with 846 cubic yards of soil and gravel removed. The results of this second phase of closure activities were summarized in a closure certification report dated January, 1999 and titled "Sign Shop Vat, Hazardous Waste Management Unit, Culpeper VDOT, Culpeper, Virginia, Closure Report". VADEQ issued a notice of clean-closure of the SSV soils.

Closure of the PP was also completed in two phases, the first prior to execution of the RCRA Compliance Agreement. The initial phase of closure was completed in the early to mid-1990's, when VDOT initiated the voluntary removal of approximately 420 drums of waste paint and 500 tons of contaminated soil. This material was characterized and sent off-site to appropriate disposal facilities. The estimated dimensions of the excavation after removal were 80 to 90 feet long, 45 feet wide, and 16 to 18 feet deep. Given that some contaminated soil was removed in addition to the drums, the size of the unit was likely somewhat smaller than area of excavation created by the removal action.

The second phase of the PP closure was completed pursuant to the July 16, 1997, document titled "Clean Closure, Contingent Closure, and Contingent Post-closure Plans-Paint Pit Area". Details concerning the earlier drum and soil removal activities were summarized in this document. In December of 1998, the soil sampling specified in the clean closure plan was conducted. The results of the closure sampling and data evaluations were summarized in the closure certification report dated July 8, 1999 and titled "Closure Report, Paint Pit Area and Hot Vat Stripper Ditch Waste Management Units, Culpeper VDOT, Culpeper, Virginia". VADEQ subsequently approved clean-closure of the unit for soils as per correspondence dated September 13, 2000.

Groundwater Detection Monitoring

Groundwater detection monitoring was implemented and completed for the HVSD between April of 1998 and July of 1999 in accordance with the August 14, 1998 plan titled "Groundwater Detection Monitoring Plan – Revision 2, Hot Vat Stripper Disposal Area, VDOT Culpeper District Headquarters Facility". The results of the groundwater monitoring and evaluation of the data were summarized in the June 23, 1999 report titled "Groundwater Detection-Monitoring

Program Summary Report, Hot Vat Stripper Ditch Area, VDOT Culpeper District Headquarters Facility". The results of the groundwater detection-monitoring program revealed that operation of the unit had not adversely affected groundwater. Accordingly, VDEQ did not require further action for groundwater, and the HVSD HWMU was "clean closed".

Groundwater Quality Assessment

During assessment work to characterize the geology and hydrogeology of the site, it was determined that operation of the SSV had impacted groundwater. Similarly, impact to groundwater from operation of the PP was also discovered during the early stages of the groundwater detection-monitoring program for the unit. Accordingly, a groundwater quality assessment plan (GQAP), titled "Groundwater Quality Assessment Plan, Sign Shop Vat and Paint Pit Areas, Revision 1" dated May 20, 1997, was prepared in order to outline the technical approach for assessing the extent of groundwater impact and further characterizing the Site hydrogeology. Subsequent to approval of the GQAP by VADEQ, the first phase of the assessment was completed and the results summarized in a report titled "Phase 1 Groundwater Quality Assessment-Sign Shop Vat and Paint Pit Areas", dated July 30, 1999. Additional groundwater assessment phases were conducted, as summarized in the "Phase 2 Groundwater Quality Assessment Report", dated February 24, 2004; and "Summary Report for Results of Phase 3 Ground Water Quality Assessment" report ("Phase 3 Report") dated October 29, 2004.

Post-closure Care Permit

In the September 13, 2000 VADEQ correspondence referenced in Section 3.1.3, VDOT was required to submit a Post-Closure Care Permit (PCCP) application for the PP and SSV. The permit application was originally submitted on March 15, 2001, with subsequent revisions submitted on January 5, April 19, and August 8, 2002. The PCCP was completed by DEQ on September 14, 2005 and received by VDOT on April 7, 2006. The PCCP outlined VDOTs requirements for post-closure care, groundwater compliance monitoring and corrective action associated with the three HWMUs.

Compliance Monitoring Program

During the course of the Groundwater Quality Assessment, VDOT conducted semi-annual groundwater monitoring and reporting associated with the PP and SSV areas. Subsequent to receiving the PCCP, VDOT conducted semi-annual compliance monitoring and reporting in accordance with Module V of the PCCP. The compliance-monitoring program continued through the half of 2010.

Corrective Action Monitoring Program

On January 28, 2009, VADEQ issued correspondence to VDOT requesting establishment of a Corrective Action Program for the PP and SSV due to ongoing exceedances of the Groundwater Protection Standards at both units. Accordingly, on July 23, 2009, VDOT submitted a document titled "Class III Permit Modification Request" wherein the technical basis and monitoring plan was outlined for implementing Monitored Natural Attenuation as the Corrective Measure for groundwater at these HWMUs. Subsequent revisions to the request were submitted by VDOT on August 28, 2009 and January 26, 2010. VDOT satisfied public notification requirements for the Class III Permit Modification via publishing a notice in the Culpeper Times on February 1,

2010, completing required mailings to those on the facility mailing list, and holding a public informational meeting at the facility on February 23, 2010. VADEQ issued a draft of the permit for the Permit Modification on July 1, 2010, and initiated the public comment period on July 23, 2010. The required 45-day public comment period expired on September 7, 2010. The only comments received by VADEQ were those provided by VDOT, and the comments were addressed in the VADEQ Response to Comments Document (RTCD), dated September 21, 2010. The Class III Permit Modification was formally approved by VADEQ on September 21, 2010 and revised permit sections were issued. A copy of the September 21, 2010 correspondence is provided in Appendix A. Subsequent to this approval by VADEQ, VDOT has performed semi-annual monitoring and reporting in accordance with Module VII "Corrective Action Program, Groundwater Monitoring – Regulated Units".

Solid Waste Management Units

Assessment and Corrective Action Prior to RFI

Releases from SWMUs 1-5 and SWMU 7 were identified during closure activities to remove underground and above-ground storage tanks from the facility. Various soil and groundwater assessments were conducted during and after the closures, and residual impacts to soil and/or groundwater from gasoline and/or diesel fuel remained in the area of these SWMUs. VADEQ evaluated all of the environmental data from each area, and determined that the residual impacts did not require any further assessment or corrective action at the time, and closed each incident.

VDOT implemented a voluntary remedial action at SWMU 9 in 2003 to remove surface soil across an area where visible debris associated with batteries was identified. Approximately 3-6 inches of surficial soil was removed in area with dimensions about 45 by 50 feet. The soil was staged in a roll-off container, characterized, and disposed off-site at a permitted facility. Post-removal sampling was conducted at superimposed grid-node locations. The results for lead at one grid-node location and select polynuclear aromatic hydrocarbons (PAHs) at a second grid-node location exceeded risk-based screening levels for unrestricted land use.

Phase I RCRA Facility Investigation

VDOT completed the Phase I RCRA Facility Investigation (RFI) in accordance with the Phase I RFI Work Plan dated July 7, 2006, revised June 28, 2007. The elements of the Phase I RFI focused on assessing current groundwater quality conditions associated with the previously closed petroleum fuel USTs (SWMUs 1-5) and ASTs (SWMU 7), and assessing soil to identify if a release had occurred associated with operation of the Former Salvage Metal and Debris Storage Site (SWMU 8) and the Suspect Waste Disposal Area (SWMU 10). VDOT elected to address the minor soil impacts at SWMU 9 (Former Equipment and Battery Storage Area) via Interim Measures. The results of the Phase I RFI were summarized in detail in the Phase I RCRA Facility Investigation Report dated May 14, 2009. Following is a brief overview of the scope and results of the Phase I RFI

Two temporary groundwater monitoring wells were installed hydrogeologically down-gradient of SWMUs 1-5 for the purpose of assessing if impacted groundwater, if present, had migrated towards the facility boundary. The wells were developed and sampled for subsequent analysis of

TPH GRO and DRO, BTEX and methyl-tert butyl ether (MTBE). Neither sample contained concentrations of TPH GRO, benzene, ethylbenzene and xylenes at concentration above the laboratory reporting limits. Both samples contained low concentrations of TPH DRO and one of the two samples contained toluene at an estimated concentration between the laboratory method detection limit and quantitation limit. The estimated concentration of toluene was, however, below the EPA MCL and, moreover, toluene was also identified in the trip blank at a similar estimated concentration. No EPA MCLs are established for TPH DRO and GRO.

Four temporary groundwater monitoring wells were installed, developed and sampled in the area of SWMU No. 7 where the AST system components were located. Samples from the temporary monitoring wells were analyzed for TPH GRO and DRO, BTEX and MTBE. All samples contained low concentrations of TPH DRO. One of the samples (TW-3) contained TPH GRO and BTEX constituents. The concentration of benzene in the sample from TW-3 was slightly above the EPA MCL.

At SWMU No. 8, a surface and a subsurface soil sample were collected from 15 randomly-selected sampling locations from a sampling grid superimposed over the unit. The soil samples were analyzed for VOCs, SVOCs, pesticides, herbicides, PCBs and metals. Results were compared to the Oak Ridge National Laboratory (ORNL) Regional Screening Levels (RSLs) for Residential Soil and Protection of Groundwater (PGW) dated July 7, 2008. The results of the risk-based screening for SWMU No. 10 are summarized below:

- None of the VOC concentrations exceeded applicable Residential RSLs. Chloromethane and naphthalene had estimated (J-flagged) concentrations above established PGW screening levels. There were no established RSLs for iodomethane, which was detected at low concentrations in some of the samples.
- SVOCs were detected in most of the surface samples, but in only one of the subsurface soil samples. Five SVOCs were present at concentrations exceeding the applicable residential RSL: benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[a,h]anthracene, and indeno(1,2,3-c,d)pyrene. All of the SVOCs with concentrations exceeding the Residential RSL also exceeded the PGW RSL. One additional SVOC, naphthalene, also had concentrations (all J-flagged) above the PGW RSL. Several SVOCs detected did not have any established RSLs (acenaphthylene, benzo[g,h,i]perylene, benzo[k]fluoranthene, di-n-octylphthalate, and phenanthrene. With the exception of phenanthrene, all reported concentrations were J-flagged.
- Pesticide organics were detected in several surface samples and in one subsurface soil sample. However, only two, dieldrin and toxaphene, had concentrations above the Residential RSLs and all concentrations of dieldrin were J-flagged. Pesticides with reported concentrations exceeding established PGW RSLs included the following compounds: alpha-hch(beta-BHC), technical-hch(delta-BHC), 4,4-DDT, dieldrin, and toxaphene. As mentioned above, dieldrin concentrations were all J-flagged, as were those for alpha-hch(beta-BHC) and technical-hch(delta-BHC). Endrin aldehyde and endosulfan sulfate, all reported as J-flagged do not have established PGW RSLs.
- PCBs were detected in about half of the surface soil samples but in no subsurface soil samples. The PCBs detected at concentrations above the PGW RSL included Aroclor-1248, Aroclor-1254 and Aroclor-1260. The highest concentration of Aroclor-1254 also

exceeded the Residential RSL.

- All targeted metals (antimony, arsenic, barium, beryllium, cadmium, chromium (total), cobalt, copper, lead, nickel, selenium, silver, thallium, tin, vanadium, zinc and mercury) were inconsistently detected in the soil samples (as expected due to their natural occurrence). Background sampling was not performed as part of the Phase I RFI. Metals with concentrations above residential RSLs included antimony, arsenic, cadmium, cobalt, vanadium, and zinc. Copper, cadmium, and zinc were also present in laboratory method blanks, although the maximum concentrations in samples exceeded five times the blank concentration. With the exception of mercury, none of the targeted metals had established PGW RSLs. Cobalt has neither an established Residential RSL nor a PGW RSL. The presence of silver could be laboratory-related as concentrations in samples were less than five times those in the method blank.

For assessing SWMU No. 10, one surface and one subsurface soil sample was collected from fifteen randomly selected sampling locations from a sampling grid superimposed over the unit. Groundwater was sampled at two locations. Soil results were compared to the July 7, 2008 ORNL RSLs for Residential Soil and PGW. Groundwater analytical results were compared to EPA MCLs, or if no EPA MCL was established, the ORNL RSLs for tapwater (dated July 7, 2008). The results are summarized below:

- At all of the fifteen soil sample locations, surface soil samples had detectable concentrations of VOCs. None of the VOC concentrations exceeded Residential RSLs. Four VOCs, benzene, chloromethane, methylene chloride and naphthalene, were detected at levels above established PGW RSLs. Benzene and naphthalene, common petroleum constituents, were attributed to the AST area (SWMU 7) located adjacent to the SWMU 10. Petroleum odor was observed during the assessment, and TPH GRO and DRO were identified in one of the soil samples. Iodomethane, was present at J-flagged concentrations, but had no established Residential RSL or PGW RSL.
- None of the detected pesticides were present in soil at concentrations exceeding the Residential RSLs and only two, beta-hch(beta-BHC) and technical-hch(delta-BHC), were present at concentrations above the PGW RSLs. The concentrations of beta-hch were J-flagged.
- A low concentration of the herbicide 2,4,5-T was detected at one soil sample location. The concentration was below the Residential RSL and PGW RSL.
- All soil sample locations had detectable concentrations of metals. Concentrations of antimony, arsenic, lead, thallium, and vanadium were above the Residential RSL. The maximum concentration of mercury was above the PGW RSL. There were no established Residential RSLs or PGW RSLs for cobalt. There were no PGW RSLs established for the remaining 13 detected metals (antimony, arsenic, barium, beryllium, chromium, copper, lead, nickel, selenium, silver, thallium, vanadium, and zinc).
- The groundwater sample results revealed low levels of VOCs. Two of these VOCs, acetone and methylene chloride, are common laboratory artifacts, but nonetheless, the concentrations were each below all risk-based screening levels. The remaining detected constituents (naphthalene, toluene, and m/p xylene) are common petroleum constituents and were attributed to the nearby AST area (SWMU 7). Metals were the only other analytes detected. Barium, beryllium, lead, and vanadium concentrations were above the

Tapwater RSL or EPA MCL. Barium and beryllium were also present in the method blank. Cobalt was detected but there were no PGW screening levels available for cobalt. Since the samples were procured from temporary one-inch monitoring wells, results were likely biased high by sample turbidity.

Post-RFI Activities

The following provides a summary of additional assessment and regulatory activity subsequent to submittal of the Phase I RFI Report.

VDOT elected to address the impacts to soil identified in SWMU 9 during past investigation of this unit through Interim Measures (IMs). On December 9, 2009, VDOT submitted "Interim Measure Remediation Work Plan – Former Equipment and Battery Storage Area" to VADEQ. The document proposed excavation and off-site disposal as the IM to effectively remediate the soil to levels that would support clean closure of the unit.

On November 10, 2010, VDOT submitted revised versions of Tables 3 and 5 from the Phase I RFI Report. These tables provided results of the preliminary risk-based screening for constituents identified in soil at SWMU 7 and SWMU 10, and incorporated the ORNL RSLs updated in May of 2010. In addition to comparison to the updated Residential Soil RSLs and Protection of Groundwater RSLs as was performed for inclusion in the Phase I RFI Report, comparison against Industrial Soil RSLs was also performed.

As recommended in the Phase I RFI Report, on December 20, 2010, a permanent two-inch groundwater monitoring well was installed at the former location of TW-5 at SWMU No. 10 in order to further evaluate the concentrations of barium, beryllium, cobalt, lead, and vanadium. The well was developed, then purged and sampled using low-flow methodology. The sample was then analyzed for the referenced metals. Barium and cobalt were the only targeted constituents that were detected in the sample at concentrations above the laboratory method detection limits (MDLs). The concentration of cobalt was between the MDL and laboratory reporting limit (RL), and therefore, the reported concentration was estimated ("J-flagged"). Barium was also detected in the laboratory method blank; the concentration reported for the sample was less than five times the concentration detected in the blank. The results for barium and cobalt were compared to the lower of the EPA MCL and ORNL RSL for tapwater; concentrations of both barium and cobalt were below the screening levels. The investigation procedures and results were submitted to VADEQ in a January 20, 2011 report titled "Results of Well Installation and Sampling, SWMU #10 – Suspect Waste Disposal Area". The report recommended no further action to address groundwater at SWMU 10.

April 8, 2011 VADEQ Comments

On April 8, 2011, VADEQ provided review comments to VDOT on the Phase I RFI Report, the November 4, 2010 revised risk-based screening tables, and the January 20, 2011 report referenced above in Section 3.2.5.2. The letter, included in Appendix A for reference, stated that the three submittals were approved as complete, and provided the following comments regarding conducting further actions at the site for the SWMUs assessed to date as part of the Phase I RFI.

- Comment 1: VADEQ approved removal of SWMUs 1 through 5 from further

consideration and investigation.

- Comment 2: VADEQ requested a confirmatory sample in the location of TW-3 at SWMU 7 to further evaluate the presence of benzene at levels slightly above the EPA MCL.
- Comment 3: VADEQ requested an Interim Measures (IM) Work Plan or CMS evaluating remedies to address the presence of lead and other VOCs at levels above both the residential and industrial screening levels in the surface soils at SWMU 8.
- Comment 4: VADEQ requested implementation of the IM Work Plan for SWMU 9.
- Comment 5: Since concentrations of contaminants of concern (COCs) in soil exceeded the Residential RSLs at SWMU 10, VADEQ requested further action to address the exceedances based on one or more of the following options: removal action; collection of additional background and unit samples; statistical evaluation against background concentrations; quantitative risk assessment; restrict land use to industrial use only, including an evaluation of the future land use scenario.
- Comment 6: VADEQ accepted VDOT's recommendation of no further action to address metals in groundwater at SWMU 10.
- Comment 7: VADEQ requested collection of a confirmatory groundwater sample from the permanent monitoring well installed at SWMU 10 to further evaluate the presence of naphthalene at concentrations slightly above the RSL.

June 30, 2011 VDOT Response to Comments

VDOT responded to the April 8, 2011 VADEQ comments in correspondence dated June 30, 2011. The pertinent action items proposed by VDOT in this correspondence were as follows:

- Installation and sampling of a permanent monitoring well at SWMU 7 to confirm the detection of benzene in groundwater at levels above the EPA MCL
- Submit an Evaluation of Potential Future Land Use to request approval from VADEQ to use industrial land use assumptions in future remedy selection
- Perform additional soil investigation at SWMUs 7 and SWMU 8, with the scope of work and schedule dependent on VADEQ's ruling on industrial land use assumptions
- VDOT reiterated intent to implement the IMWP for SWMU 9, and requested that implementation be delayed until interim or corrective measures for SWMUs 7 and 8 were determined so that actions could be performed concurrently
- VDOT also provided additional argument that the source of naphthalene detected in soil and groundwater at SWMU 10 was not related to that unit and requested no further action be required to address naphthalene

VADEQ issued a response to VDOT's June 30, 2011 comments in a letter dated September 20, 2011. VADEQ agreed with all of VDOT's comments with the exception of the request for no further action to address naphthalene at SWMU 10. VADEQ requested confirmatory groundwater sampling at SWMU 10 for naphthalene.

Confirmation Sampling for Naphthalene at SWMU 10

On November 9, 2011, VDOT performed confirmation sampling of the permanent monitoring

well installed at SWMU 10 (MW-SWD-1) employing low-flow methodology. The results of the sampling indicated that the concentration of naphthalene was below the ORNL RSL for tap water. The results were summarized in the November 15, 2011 report titled "Confirmation Sampling and Analysis for Naphthalene, Solid Waste Management Unit No. 10 (Suspect Waste Disposal Area)". On May 29, 2012, in consideration of pending approval for industrial land use assumptions at the facility, VADEQ approved no further action to address SWMU 10.

Evaluation of Potential Future Land Use

On December 6, 2011, VDOT submitted current and potential future land use documentation to support use of an industrial land use assumption for determining appropriate measures to undertake at the facility during the RCRA Corrective Action process. The information provided was as specified in the document titled "Virginia DEQ, RCRA Corrective Action Fact Sheet #1 "Land Use Assumptions for RCRA Corrective Action Baseline Risk Assessments (updated 6/7/2010)". VDOT also submitted to VADEQ, an example deed restriction on July 5, 2012. VADEQ approved use of industrial land use assumptions as per correspondence dated July 26, 2012. In this correspondence, VADEQ also requested a schedule for implementation of the additional investigations that VDOT specified in the June 30, 2011 correspondence referenced above for SWMU 8, and confirmatory groundwater sampling for naphthalene at SWMU 7.

Additional Investigations at SWMU 7 and SWMU 8

As per VDOT correspondence dated August 23, 2012, additional investigations were performed in October 2012 to assess benzene levels in groundwater at SWMU 7, and to perform chromium speciation in soil at SWMU 8 to complete Action Items 2 and 3 outlined in the August 23, 2012 letter. The results were summarized in the November 27, 2012 report titled "Results of Phase I RFI Follow-up Actions, Action Item 2: Chromium Speciation – SWMU No. 8, Action Item 3: Confirmatory Groundwater Sampling – SWMU No. 8. The results of the investigations confirmed that the levels of benzene in groundwater at SWMU 7 were slightly above the EPA MCL, and that hexavalent chromium was present in the surface soil at SWMU 8. In addition to Action Items 2 and 3, VDOT had also proposed three additional action items as summarized below:

- Action Item 1: After completing Action Item 4, perform evaluation of metals concentrations at SWMU 8 in accordance with VADEQ's RCRA Corrective Action Fact Sheet # 5 "Inorganic Background Determinations for Soil During RCRA Corrective Action Investigations".
- Action Item 4: Conduct further assessment of COCs in surface and subsurface soil at SWMU 8, and also assess soil for parameters to evaluate transfer to groundwater, as warranted.
- Action Item 5: VDOT reiterated intent to address SWMU9 via implementation of the December 9, 2009 "Interim Measures Remediation Work Plan" as previously stated in the June 30, 2011 letter referenced above.

On December 6, 2012, VADEQ issued correspondence via electronic mail indicating that the agency had reviewed the November 27, 2012 report referenced above. VADEQ also documented discussions during a December 5, 2012 conference call conducted by VADEQ and VDOT, during which it was concluded by both parties to forgo additional investigation at

SWMU 8 and move towards performing soil removal as an IM at this unit along with implementation of the IMWP at SWMU 9. In addition, other discussions were conducted regarding options to address benzene in groundwater at SWMU 7. Options discussed included collection of independent groundwater samples and long-term monitoring.

Monitoring of Benzene at SWMU 7

To address the detection of benzene in groundwater at concentrations slightly above the EPA MCL during the Phase I RFI follow-up actions discussed above, VDOT elected to conduct four independent groundwater monitoring events at MW-BSA-1 to further evaluate the concentration of benzene in groundwater at this unit. The results for all four monitoring events were below the EPA MCL for benzene. On July 1, 2013, a report titled "Evaluation of Benzene in Groundwater at MW-BSA-1 SWMU 7" was submitted to VADEQ to present the results from these monitoring events. The report recommended that SWMU 7 be removed from further assessment and/or corrective action requirements. On July 2, 2013, VADEQ issued correspondence approving this recommendation.

During evaluation of alternatives for IMs at SWMU 8 and related discussions with VADEQ, it was decided to forego IMs and develop the Corrective Measures Study (CMS) for the facility as documented in the March 25, 2013 e-mail correspondence from VADEQ to VDOT. At this juncture, eight of the ten SWMUs identified at the facility (SWMU Nos. 1-7 and 10) have received a "no further action required" ruling from VADEQ, and were therefore excluded from consideration during the subsequent remedy evaluation and selection components of the CMS. Accordingly, the CMS was prepared to evaluate and select remedies to address environmental impacts associated with SWMU Nos. 8 and 9. The CMS document (May 31, 2013, Revised August 1, 2013) was approved by VADEQ on December 18, 2013. The selected remedies for these SWMUs are outlined in Module VI.

ATTACHMENT B

SITE MAPS

CULPEPER DISTRICT HEADQUARTERS

Map No. B-1, Monitoring Well Location Map, dated 5/5/2014

Map No. B-2, Groundwater Flow Map, dated 5/5/2014

Map No. B-3, Facility Location Map, dated 5/5/2014

Map No. B-4, Facility Layout, dated 5/5/2014

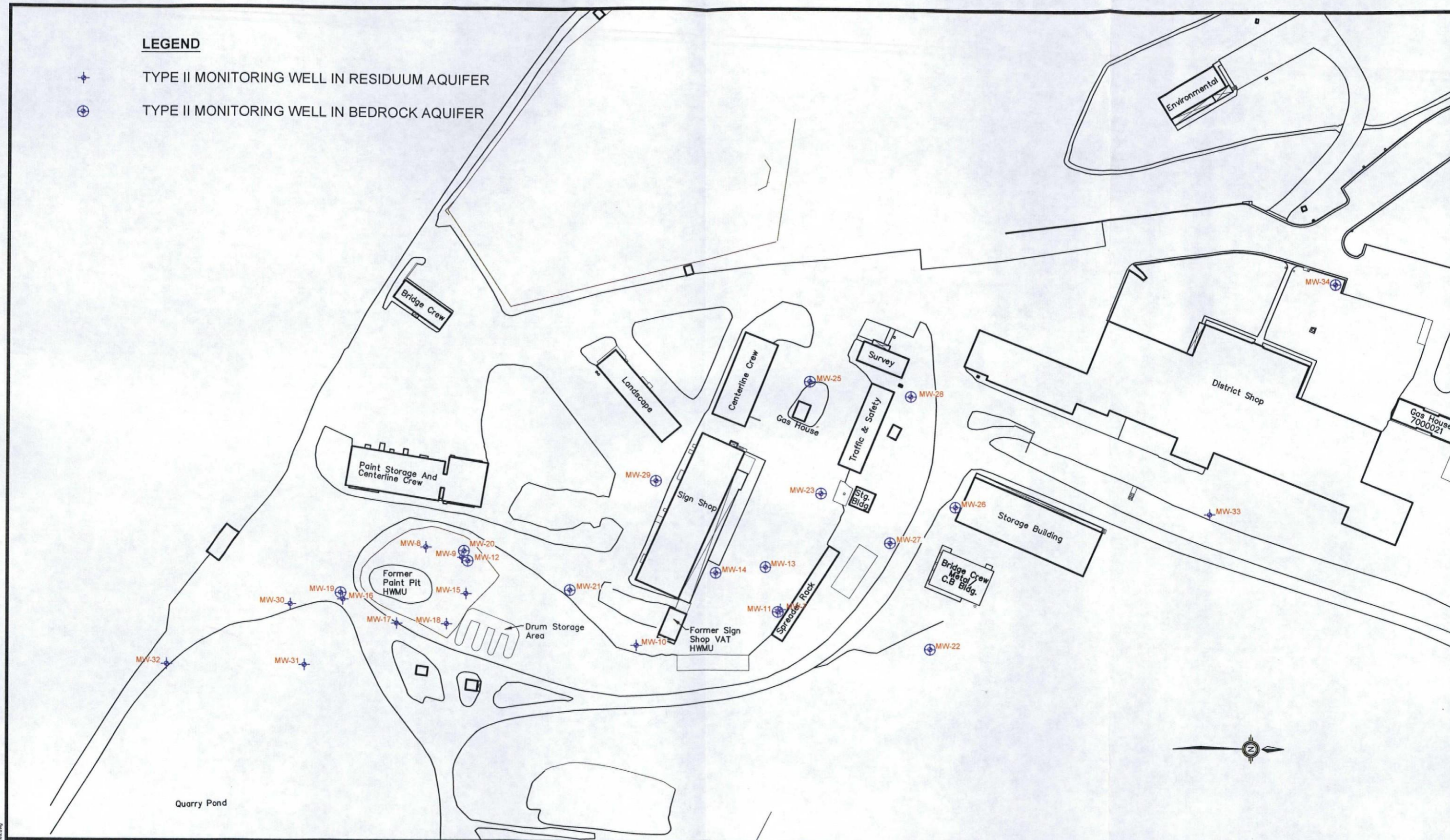
LEGEND



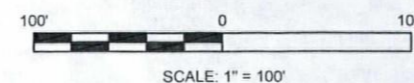
TYPE II MONITORING WELL IN RESIDUUM AQUIFER



TYPE II MONITORING WELL IN BEDROCK AQUIFER



DESIGNED:	CR	NO	DATE	REVISION
DRAWN:	EMC			
CHECKED:	LG			
DATE:	5/5/2014			
SCALE:	1"=100'			
FILE NO.:	VCEN241 B Figures.dwg			
PROJECT NO.:	VCEN241			
OFFICE LOC.:	RALEIGH			



CULPEPER DISTRICT HEADQUARTERS
CULPEPER COUNTY, VIRGINIA

MONITORING WELL LOCATION MAP
PAINT PIT AND SIGN SHOP VAT AREAS

FIGURE

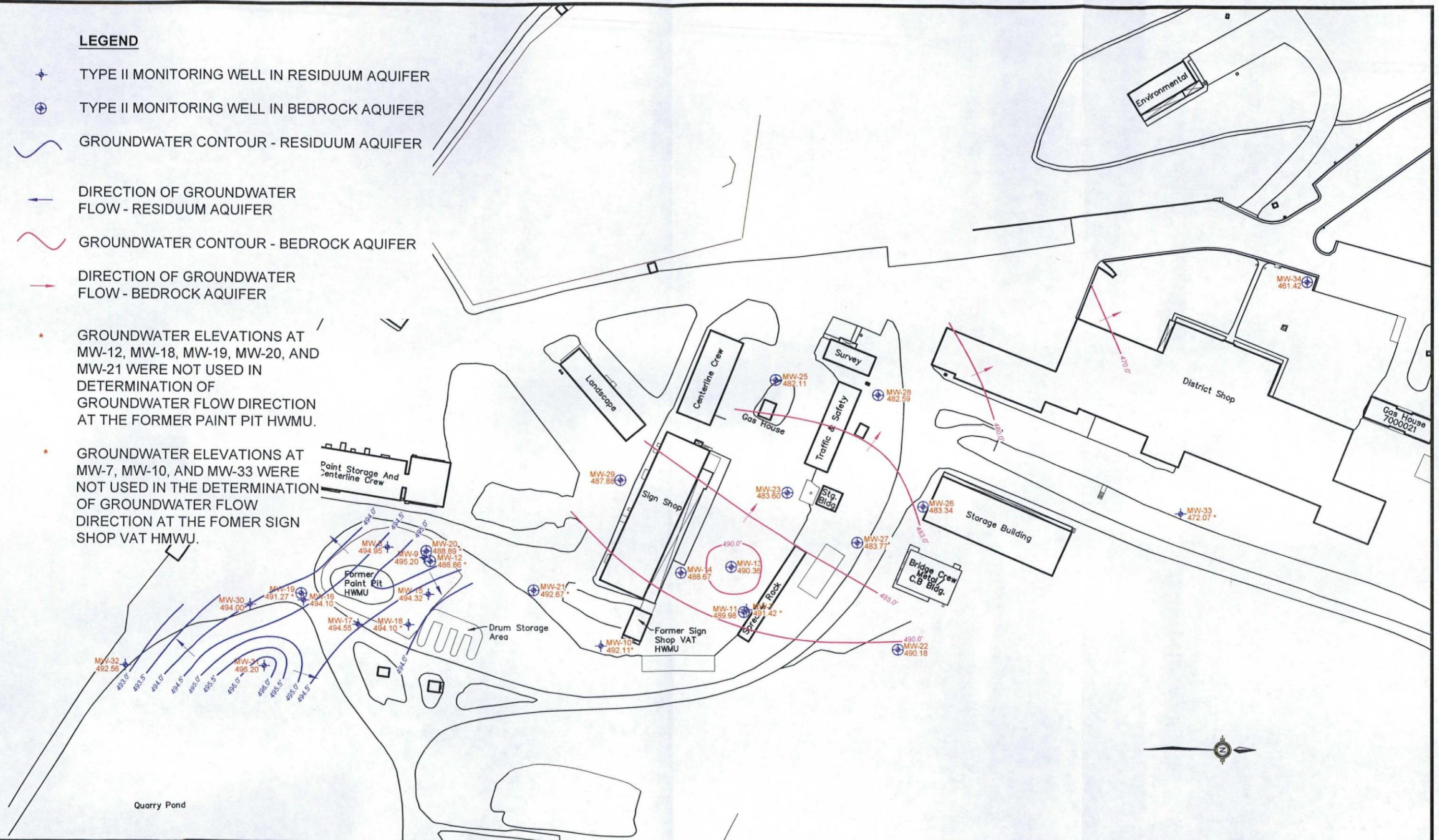
B-1

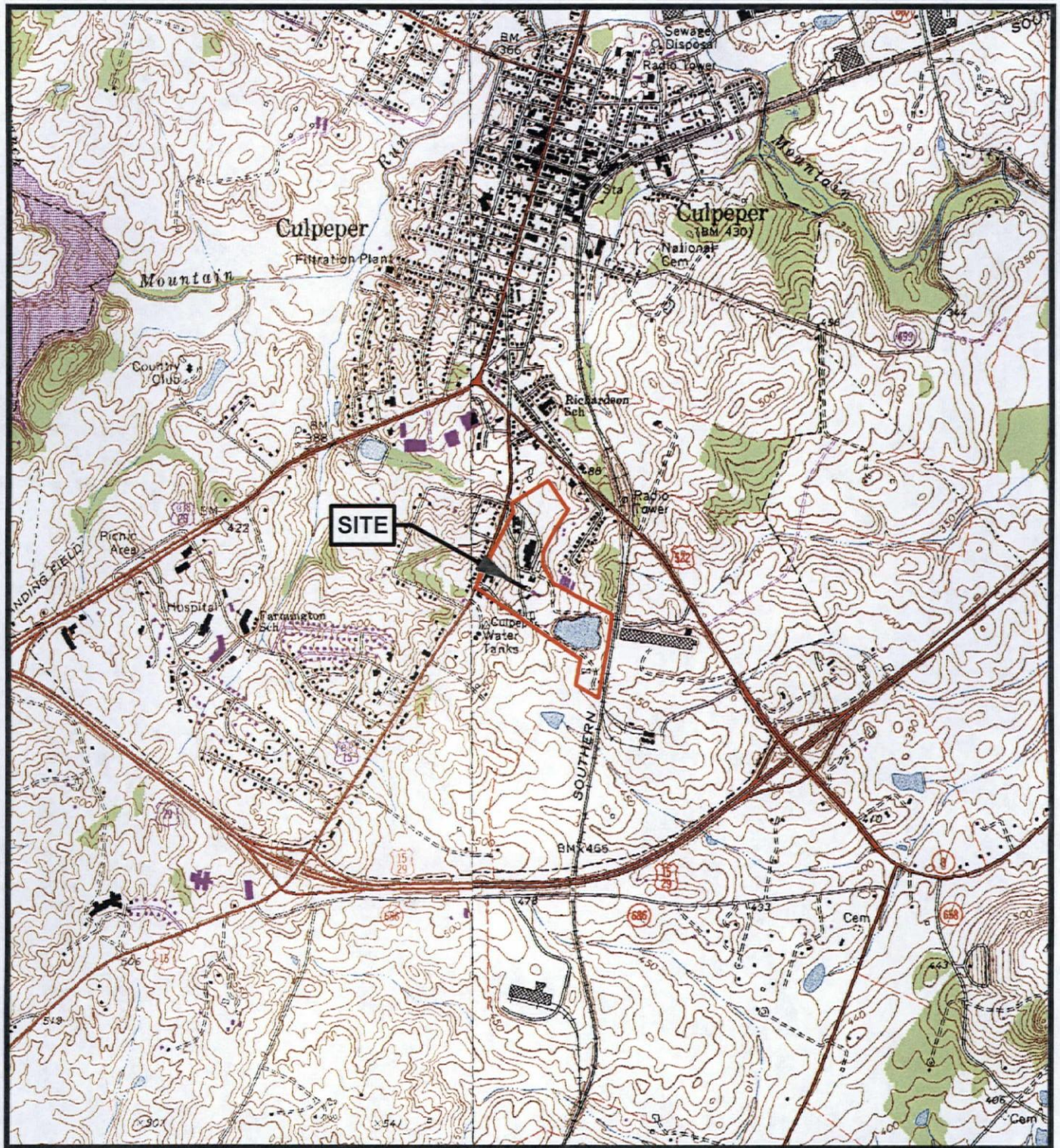
LEGEND

- TYPE II MONITORING WELL IN RESIDUUM AQUIFER
- TYPE II MONITORING WELL IN BEDROCK AQUIFER
- GROUNDWATER CONTOUR - RESIDUUM AQUIFER
- DIRECTION OF GROUNDWATER FLOW - RESIDUUM AQUIFER
- GROUNDWATER CONTOUR - BEDROCK AQUIFER
- DIRECTION OF GROUNDWATER FLOW - BEDROCK AQUIFER

* GROUNDWATER ELEVATIONS AT MW-12, MW-18, MW-19, MW-20, AND MW-21 WERE NOT USED IN DETERMINATION OF GROUNDWATER FLOW DIRECTION AT THE FORMER PAINT PIT HWMU.

* GROUNDWATER ELEVATIONS AT MW-7, MW-10, AND MW-33 WERE NOT USED IN THE DETERMINATION OF GROUNDWATER FLOW DIRECTION AT THE FORMER SIGN SHOP VAT HWMU.





USGS 7.5' CULPEPER EAST, VA QUADRANGLE - 1973

FIGURE B-3



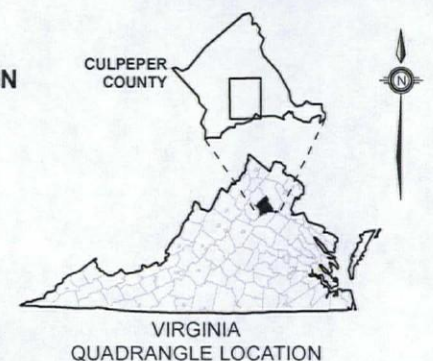
SOURCE:
 - United States Geological Survey
 7.5' Quadrangles -
 Culpeper East, VA 1973
 - Photorevised 1978, Photoinspected 1981
 Culpeper West, VA 1971
 - Photorevised 1979

PROJECT NO.: VCEN241
 DATE: 5/5/2014
 OFFICE LOCATION: Raleigh

VIRGINIA DEPARTMENT OF TRANSPORTATION
 CULPEPER DISTRICT HEADQUARTERS
 1601 ORANGE ROAD
 CULPEPER, CULPEPER COUNTY, VIRGINIA

2,000' 0 2,000'
 1:24,000

FACILITY LOCATION MAP



VIRGINIA
 QUADRANGLE LOCATION

ATTACHMENT E

POST-CLOSURE PLAN:
CLOSED HAZARDOUS WASTE MANAGEMENT UNITS

ATTACHMENT E

POST-CLOSURE PLAN: CLOSED HAZARDOUS WASTE MANAGEMENT UNITS

A. INTRODUCTION

- A.1 Post-closure care shall continue for 30 years after certification of closure (September 13, 2000) and consists of monitoring and reporting in accordance with the requirements of 40 CFR Part 264 and **Permit Part V**.
- A.2 Use of the property subject to this post-closure care plan shall never, during the post-closure care period, be allowed to disturb the integrity or the function of the facility's monitoring system unless the facility demonstrates to the Director that the disturbance:
- a. Is necessary to the proposed use of the property and will not increase the potential hazard to human health or the environment; or
 - b. Is necessary to reduce the threat to human health or the environment.

Such use will require the written permission of the Director prior to implementation.

B. INSPECTION AND MAINTENANCE SCHEDULE

B.1 Benchmarks

Benchmarks were installed to act as points of reference for locating the monitoring wells and determining the groundwater potentiometric surface. Benchmarks were installed by a certified land surveyor. Their location and elevation are tied into the property boundary and are recorded in the deed to the property. The Permittee shall inspect annually for defective or disturbed benchmarks and note changes. If the benchmarks have been disturbed, then the benchmarks shall be resurveyed. .

B.2 Groundwater monitoring wells

At least semiannually, inspect and maintain all monitoring wells and piezometers to sustain their original intended purpose. Monitoring well locking caps shall be locked at all times except when the monitoring wells are being sampled or maintained. Protective concrete aprons shall be inspected for subsidence and breakage. Monitoring wells shall be replaced or repaired as necessary (for diagram see **Permit Attachment I, Appendix 5**).

B.3 Security

Adequate security shall be maintained to prohibit unauthorized access to the site.

B.4 Records

All inspections shall be logged and documentation provided in each annual Corrective Action Program annual groundwater monitoring report, which shall be maintained at the facility during the entire post-closure care period. The inspection results and groundwater sampling and analysis results shall be available at the facility for the Department of Environmental Quality representatives during periodic on site inspections of the facility.

C. FACILITY CONTACT

The post-closure care contact representative for the Culpeper site is noted below:

Mr. Ed Wallingford
Virginia Department of Transportation
Environmental Division
1401 East Broad Street
Richmond, Virginia 23219
Phone: (804)-371-6824

The facility copy of the Post-Closure Plan is maintained in the facility files at the Culpeper site in Culpeper, Virginia. Mr. Wallingford is responsible for storage and updating of the Post-Closure Plan during the post-closure period

APPENDIX 1
CERTIFICATION OF CLOSURE

ATTACHMENT F
SECURITY PROVISIONS

ATTACHMENT F

SECURITY PROVISIONS

Security of the entire site is maintained by a barrier system consisting of a six-foot chainlink fence and gate, which provides personnel and equipment access for maintenance. The location of the fence is shown on **Attachment B**. The gate is open during normal operational hours, but otherwise locked. Groundwater monitoring wells are locked at all time except when the monitoring wells are being sampled or maintained.

ATTACHMENT G
INSPECTION REQUIREMENTS

ATTACHMENT G

INSPECTION REQUIREMENTS

A. HIGHLIGHTS

In accordance with 40 CFR 264.15, the Permittee is to follow a written inspection schedule observing malfunction, deterioration, or operational errors in the monitoring systems for the waste management units; implement remedial action when necessary; and maintain a signed and dated inspection log at the facility and available to the DEQ upon request which provides inspection observations, deficiencies noted, and corrective action taken (an example of inspection logs containing the minimum information are depicted in Appendices 1 and 2 of this Attachment) The Permittee is to inspect, at the frequency specified for the following as noted below:

- B. The Permittee shall inspect for damage to groundwater monitoring wells and piezometers (i.e., unlocked protective cover, unsecured protective casing, damaged well and/or defective concrete pad) during each groundwater monitoring event.
- C. The Permittee shall inspect during sampling for unsatisfactory performance or operational deficiencies of the wells and piezometers (obstructions, bends, excess sediment accumulation, grout erosion, inadequate yield, etc.).

D. ANNUAL INSPECTIONS

The Permittee shall inspect annually for defective or disturbed benchmarks and note changes. If the benchmarks have been disturbed, then the benchmarks shall be resurveyed.

APPENDIX 1
EXAMPLE INSPECTION LOG

Note. a separate inspection sheet is required for each monitoring well.

MONITORING WELL: _____

A. Inspected by (full name): _____

B. Date/Time of Inspection: _____

C. Inspection Observations: _____

C.1 Locking protective casing: _____

C.2 Concrete well Pad: _____

C.3 Lock: _____

C.4 Erosion: _____

C.5 Exterior well identification number _____

C.5 Exterior well identification number _____

Inspection Comments: _____

Repair/remediation Comments: _____

F. Repair/remediation Date. _____

APPENDIX 2
EXAMPLE ANNUAL INSPECTION LOG

ANNUAL INSPECTION-BENCHMARK VERIFICATION

A. Inspected by (full name): _____

B. Date/Time: _____

C. Inspection Observations: _____

D. Determine location of all benchmarks and note changes: _____

E. Attach results of benchmark survey.

F. Repair/remediation Comments: _____

G. Repair/remediation Date: _____

ATTACHMENT M

LIST AND DESCRIPTIONS OF KNOWN SOLID WASTE MANAGEMENT UNITS
(SWMUS) HAZARDOUS WASTE MANAGEMENT UNITS (HWMUS)
AND AREAS OF CONCERN (AOCS)

ATTACHMENT M

**LIST OF KNOWN SOLID WASTE MANAGEMENT UNITS,
HAZARDOUS WASTE MANAGEMENT UNITS, AND
AREAS OF CONCERN**

The list of solid waste management units (SWMUs), hazardous waste management units (HWMUs), and areas of concern (AOCs) for VDOT's Culpeper site (EPA ID No. VAD980715064), is identified in Attachment M, Table M-1 and in Attachment B, Figure B-4, Facility Layout.

Table M-1
List and Descriptions of SWMUs, HWMUs, and AOCs

1. HWMU No. 1: Hot Vat Stripper Ditch

HWMU No. 1, classified as a surface impoundment, was a shallow, narrow, surface drainage swale approximately 600 feet in length. An alkaline solution (pH of 14) from an equipment cleaning unit was reportedly periodically discharged into the surface drainage swale. Risk-based closure of the unit was completed for both soil and groundwater.

2. HWMU No. 2: Sign Shop Vat

HWMU No. 2, classified as a surface impoundment, was constructed analogous to a septic system with a tank constructed of concrete block connected to a subsurface drain field. Solvent used for stripping coatings from road signs was discharged into the tanks on an annual basis for a period of four years prior to 1980. The HWMU was closed via removal of the components and impacted soil. Residual groundwater impacts are being addressed via Module VII of this permit.

3. HWMU No. 3, Paint Pit

HWMU No. 3, classified as a landfill, was an area where containerized paint products were disposed in the subsurface in the late 1970's. The containers and impacted soil were excavated and removed in the early to mid 1990's. Subsequent soil sampling was performed verifying clean-closure of the unit for soil. Residual impacted groundwater is being addressed via Module VII of this permit.

4. SWMU No. 1: Closed Heating Oil UST (HO1)

SWMU No. 1 was a 2,000-gallon capacity underground storage tank (UST) used for storing virgin heating oil. The UST was constructed of steel. The installation date was unknown and the UST was closed via removal in August/September 2000.

5. SWMU No. 2: Closed Heating Oil UST (HO2)

SWMU No. 2 was a 550 gallon capacity UST used for storing virgin heating oil. The UST was constructed of steel. The installation date was unknown and the UST was closed via removal in August/September 2000.

6. SWMU No. 3: Closed Heating Oil UST (HO3)

SWMU No. 3 was a 550-gallon capacity UST used for storing virgin heating oil. The UST was constructed of steel. The installation date was unknown and the UST was closed via removal in August/September 2000.

7. SWMU No.4: Closed Heating Oil UST (HO4)

SWMU No. 4 was a 550-gallon capacity UST used for storing virgin heating oil. The UST was constructed of steel. The installation date was unknown and the UST was closed via removal in August/September 2000

8. SWMU No. 5: Closed Gas/Diesel USTs at Equipment Shop/Garage

SWMU No. 5 consisted of four steel USTs including capacities of 10,000 gallons and 2,000 gallons for storage of virgin gasoline, and 2,000 gallons and 1,500 gallons for storage of virgin diesel fuel. The installation date was unknown and the USTs were closed via removal in May of 1992.

9. SWMU No. 6: Closed Gas/Diesel USTs at Sign Shop Area

SWMU No. 6 consisted of three steel USTs including capacities of 1,000 gallons and 2,000 gallons for storage of virgin gasoline, and 10,000 gallons for storage of virgin diesel fuel. The 1,000-gallon gasoline UST and the 10,000-gallon diesel fuel UST were installed Circa 1977, and the 2,000-gallon gasoline UST was installed Circa 1961. The three USTs were closed via removal in September of 1997.

9. SWMU No. 7: Closed Gas/Diesel ASTs at Bulk Storage Area

SWMU No. 7 included six steel above-ground storage tanks (ASTs) including three 20,000-gallon and one 18,000-gallon ASTs used for storage of virgin diesel fuel, and two 20,000-gallon ASTs used for storage of virgin gasoline. The installation date was unknown, and the ASTs were close by removal in February of 1996.

10. SWMU No. 8: Former Salvage Metal and Debris Storage Site

SWMU No. 8 was defined as an accumulation area for salvage metal and other debris and is approximately one-half acre or less in size. The specific quantities and types of materials staged in this area are unknown and the precise dates of operation were not known; although accumulation activity was visible in aerial photographs dated from 1960 to 1963.

11. SWMU No. 9: Former Equipment and Battery Storage Area

SWMU No. 9 was an equipment and battery storage area occupying about 0.14 acres. An inventory of items stored in the area was not available, but batteries were certainly a component of these materials as evidence of battery parts were observed during previous assessment/corrective action activities undertaken at the unit. The dates of operation were undetermined.

12. SWMU No. 10: Suspect Waste Disposal Area (Near Bulk Fuelling Area)

SWMU No. 10 was a potential waste disposal area identified through interviews with VDOT personnel. According to these interviews, previous equipment cleaning operations may have occurred in the area. The cleaning included equipment used for application of paints, pesticides and herbicides. Information regarding dimensions and dates of operation was not available.

Note: HWMUs and former HWMUs are identified in bold text

ATTACHMENT N

HEALTH AND SAFETY PLAN REQUIREMENTS

ATTACHMENT N

HEALTH AND SAFETY PLAN REQUIREMENTS

The Permittee shall prepare a facility Health and Safety Plan for Corrective Action RCRA Facility Investigations (RFIs) and Corrective Measures activities at the Permitted facility and shall submit to the Department and the EPA Region 3. Compliance with the Occupational Safety and Health Administration (OSHA) Regulations is not under the jurisdiction or the authority of the Department or the EPA in the Commonwealth of Virginia. Therefore, the Health and Safety Plan submittal to the Department and the EPA Region 3 is for the administrative record only and the submittal will not receive approval nor disapproval by the Department or the EPA.

In the Commonwealth of Virginia, compliance and enforcement of the OSHA regulations under 29 C.F.R. 1910.120, falls under the authority of the Virginia Office of Safety and Health, the Virginia Department of Labor and Industry. Therefore, the above office should be contacted to determine the major elements and requirements for a Health and Safety Plan under the OSHA Regulations

ATTACHMENT P
REMEDIAL CLEANUP TARGETS
CULPEPER DISTRICT HEADQUARTERS

Table P-1: SWMU #8 – Summary of COC's for Soil, Industrial Risk-based Screening

Table P-2: SWMU #8 – Summary of COCs for Soil, Protection of Groundwater Risk-based Screening

Table P-3: SWMU #9 – Summary of COC's for Soil, Residential Risk-based Screening

Table P-4: SWMU #9 – Summary of COCs for Soil, Protection of Groundwater Risk-based Screening



TABLE P-1

**SWMU #8 - SUMMARY OF COCs FOR SOIL
INDUSTRIAL RISK-BASED SCREENING
VDOT CULPEPER DISTRICT HEADQUARTERS**

Chemical Constituent Name	CAS #	C or NC	Screening Levels*		Background	Cleanup Objectives Met By Proposed Remedy
			Industrial Soil	Industrial Soil x 0.1		
Volatile Organic Compounds by Method SW-846 8260B (mg/kg)						
Iodomethane	74884	NL	NL	NL	NA	Eliminate potential exposure pathways for contact with impacted soil
Semivolatile Organic Compounds by EPA Method SW-846 8270C (mg/kg)						
Acenaphthylene	208968	NL	NL	NL	NA	Eliminate potential exposure pathways for contact with impacted soil
Benzo[a]pyrene	50328	C	0.21	0.021	NA	Eliminate potential exposure pathways for contact with impacted soil
Benzo[g,h,i]perylene	191242	NL	NL	NL	NA	Eliminate potential exposure pathways for contact with impacted soil
Di-n-octylphthalate	74884	NL	NL	NL	NA	Eliminate potential exposure pathways for contact with impacted soil
Phenanthrene	85018	NL	NL	NL	NA	Eliminate potential exposure pathways for contact with impacted soil
Pesticide Organics by EPA Method SW-846 8081 (mg/kg)						
Toxaphene	8001352	C	1.6	0.16	NA	Eliminate potential exposure pathways for contact with impacted soil
Polychlorinated Biphenyls by EPA Method SW-846 8082 (mg/kg)						
Aroclor-1254	11097691	C	0.74	0.074	NA	Eliminate potential exposure pathways for contact with impacted soil
ICP Metals by EPA Method SW-846 6010B/6020 (mg/kg)						
Arsenic	7440382	C	1.6	0.16	6.2	Eliminate potential exposure pathways for contact with impacted soil
Chromium†	18540299	C	5.6	0.56	45.5	Eliminate potential exposure pathways for contact with impacted soil
Cobalt	7440484	NC	300	30	59.7	Eliminate potential exposure pathways for contact with impacted soil
Lead	7439921	NC	800	80	35	Eliminate potential exposure pathways for contact with impacted soil

* Screening levels obtained from Oak Ridge National Laboratory (ORNL) Regional Screening Levels (RSL) for chemical contaminants at Superfund Sites, May 2010

C Carcinogenic, NC Non-carcinogenic

NL Compound not listed in the May 2010 ORNL RSL tables

NA Not applicable

† = values for Chromium VI used in risk-based screening process

Bold indicates values used for risk-based screening process



TABLE P-2

**SWMU #8 - SUMMARY OF COCs FOR SOIL
PROTECTION OF GROUNDWATER RISK-BASED SCREENING
VDOT CULPEPER DISTRICT HEADQUARTERS**

Chemical Constituent Name	CAS #	C or NC	Protection of GW*		Background	Cleanup Objectives Met By Proposed Remedy
			Risk-Based SSL	MCL-Based SSL		
Volatile Organic Compounds by Method SW-846 8260B (mg/kg)						
Iodomethane	74884	NL	NL	NL	NA	Prevent migration to groundwater
Naphthalene	91203	C	0.00047	NS	NA	Prevent migration to groundwater
Semivolatile Organic Compounds by EPA Method SW-846 8270C (mg/kg)						
Acenaphthylene	208968	NL	NL	NL	NA	Prevent migration to groundwater
Benzo[a]anthracene	56553	C	0.01	NS	NA	Prevent migration to groundwater
Benzo[a]pyrene	50328	C	0.0035	0.24	NA	Prevent migration to groundwater
Benzo[b]fluoranthene	205992	C	0.035	NS	NA	Prevent migration to groundwater
Benzo[g,h,i]perylene	191242	NL	NL	NL	NA	Prevent migration to groundwater
Dibenzo[a,h]anthracene	53703	C	0.011	NS	NA	Prevent migration to groundwater
Indeno(1,2,3-c,d)pyrene	193395	C	0.12	NS	NA	Prevent migration to groundwater
Naphthalene	91203	C	0.00047	NS	NA	Prevent migration to groundwater
Phenanthrene	85018	NL	NL	NL	NA	Prevent migration to groundwater
Pesticide Organics by EPA Method SW-846 8081 (mg/kg)						
technical hch (delta-BHC)	608731	C	0.00022	NS	NA	Prevent migration to groundwater
Dieldrin	60571	C	0.00017	NS	NA	Prevent migration to groundwater
4,4'-DDT	50293	C	0.067	NS	NA	Prevent migration to groundwater
Toxaphene	8001352	C	0.0094	0.46	NA	Prevent migration to groundwater
Chlordane, Total†	12789036	C	0.013	0.14	NA	Prevent migration to groundwater
Polychlorinated Biphenyls by EPA Method SW-846 8082 (mg/kg)						
Aroclor-1248	12672296	C	0.0052	NS	NA	Prevent migration to groundwater
Aroclor-1254	11097691	C	0.0088	NS	NA	Prevent migration to groundwater
Aroclor-1260	11096825	C	0.024	NS	NA	Prevent migration to groundwater
ICP Metals by EPA Method SW-846 6010B/6020 (mg/kg)						
Antimony	7440360	NC	0.66	0.27	2.7	Prevent migration to groundwater
Arsenic	7440382	C	0.0013	0.29	6.2	Prevent migration to groundwater
Barium	7440393	NC	300	82	134	Prevent migration to groundwater



TABLE P-2

**SWMU #8 - SUMMARY OF COCs FOR SOIL
PROTECTION OF GROUNDWATER RISK-BASED SCREENING
VDOT CULPEPER DISTRICT HEADQUARTERS**

Chemical Constituent Name	CAS #	C or NC	Protection of GW*		Background	Cleanup Objectives Met By Proposed Remedy
			Risk-Based SSL	MCL-Based SSL		
Cadmium-Diet Standards	7440439	NC	NS	NS	5.15	Prevent migration to groundwater
Chromium†	18540299	C	0.00083	NS	45.5	Prevent migration to groundwater
Cobalt	7440484	NC	0.49	NS	59.7	Prevent migration to groundwater
Copper	7440508	NC	51	46	45.5	Prevent migration to groundwater
Lead	7439921	NC	NS	14	35	Prevent migration to groundwater
Nickel	7440020	NC	48	NS	25.2	Prevent migration to groundwater
Selenium	7782492	NC	0.95	0.26	ND	Prevent migration to groundwater
Vanadium & Compounds	7440622-C	NC	180	NS	256	Prevent migration to groundwater
Zinc	7440666	NC	680	NS	74.5	Prevent migration to groundwater
Mercury by EPA Method SW-846 7470A (mg/kg)						
Mercury	7439976	NC	0.03	0.1	0.142	Prevent migration to groundwater

Notes

* Screening levels obtained from Oak Ridge National Laboratory (ORNL) Regional Screening Levels (RSL) for chemical contaminants at Superfund Sites, May 2010

C: Carcinogenic, NC: Non-carcinogenic

NL: Compound not listed in the May 2010 ORNL RSL tables

NA: Not applicable

‡ = values for Chlordane used in risk-based screening process

† = values for Chromium VI used in risk-based screening process

Bold: Indicates values used for risk-based screening process



TABLE P-3

**SWMU #9 - SUMMARY OF COCs FOR SOIL
RESIDENTIAL RISK-BASED SCREENING
VDOT CULPEPER DISTRICT HEADQUARTERS**

Chemical Constituent Name	CAS #	C or NC	Screening Levels*		Background	Cleanup Objectives Met By Proposed Remedy
			Residential Soil	Residential Soil x 0.1		
Semivolatile Organic Compounds						
Benzo[a]pyrene	50328	C	0.015	0.0015	NA	Soil containing COC at concentration above RBSL removed from site
Dibenzo[a,h]anthracene	53703	C	0.015	0.0015	NA	Soil containing COC at concentration above RBSL removed from site
Indeno(1,2,3-c,d)pyrene	193395	C	0.15	0.015	NA	Soil containing COC at concentration above RBSL removed from site
Metals						
Lead	7439921	NC	400	40	35	Soil containing COC at concentration above RBSL removed from site

Notes

* Screening levels obtained from Oak Ridge National Laboratory (ORNL) Regional Screening Levels (RSL) for chemical contaminants at Superfund Sites, May 2010



TABLE P-4

**SWMU #9 - SUMMARY OF COCs FOR SOIL
PROTECTION OF GROUNDWATER RISK-BASED SCREENING
VDOT CULPEPER DISTRICT HEADQUARTERS**

Chemical Constituent Name	CAS #	C or NC	Protection of GW*		Background	Cleanup Objectives Met By Proposed Remedy
			Risk-Based SSL	MCL-Based SSL		
Semivolatile Organic Compounds						
Dibenzo[a,h]anthracene	53703	C	0.011	NS	NA	Soil containing COC at concentration above RBSL removed from site
Indeno(1,2,3-c,d)pyrene	193395	C	0.12	NS	NA	Soil containing COC at concentration above RBSL removed from site
Metals						
Lead	7439921	NC	NS	14	35	Soil containing COC at concentration above RBSL removed from site

Notes

* Screening levels obtained from Oak Ridge National Laboratory (ORNL) Regional Screening Levels (RSL) for chemical contaminants at Superfund Sites, May 2010

C Carcinogenic, NC Non-carcinogenic

NS No screening level listed in the May 2010 ORNL RSL tables

Bold Indicates values used for risk-based screening process